

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1185. (Vol. XXIII. No. 37.)

SEPTEMBER 11, 1931

Weekly, Price 6d.
[Post free, 7½d. Abroad, 8d.]

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: (2 lines), Holborn 3211 and 1884.

Telegrams: Truditur, Westcent, London.

Annual Subscription Rates, Post Free.

United Kingdom .. 33s. 0d. United States .. \$8.75.

Other Countries .. 35s. 0d.*

* Foreign subscriptions must be remitted in British currency. (See last Editorial Page.)

CONTENTS

	PAGE
Editorial Comment:	
No Schneider Challengers	893
Schneider Trophy Contest	895
Northrop Alpha and Beta	914
Vickers Duplex Air Compressor	917
Private Flying and Club News	919
Swift Flights	922
"Tern" Glider	923
Airport News	924
Night Flying at Croydon	925
Air Transport	927
Airships from the Four Winds	928
Royal Air Force	929
Models	930

EDITORIAL COMMENT



THE inability of Italy and France to raise teams to make good their challenge for the Schneider Trophy contest on September 12 is a matter of the most extreme regret to everyone. The Schneider contest is an affair of many aspects. One side is sporting; one is technical; and one is commercial. The

pilots represent chiefly, though by no means exclusively, the sporting side. They like to match their skill in flying against the best pilots that our friendly rivals can send against them. When there are no rivals to beat, the sporting side of the contest vanishes. Squadron-

Leader Orlebar and his fine team are naturally bitterly disappointed at finding themselves deprived of the chance of a trial of skill. We have no doubt that the pilots of Italy and France are equally disappointed—in fact they may feel even more sore, for the position implies some breakdown in the national organisation, and the pilots may suffer from the feeling that their nations have not even gone down fighting in a good sporting match. In 1929 the pilots of Italy won great honour for their nation by the splendid effort they made to drive untried machines and engines round the course. However, the sporting element has gone out of this year's Schneider contest, and we must make the best of the elements which remain.

On the technical and research side, this year's contest marks no startling improvement in design such as marked the contest of 1926, when Italy won with a low-wing monoplane; that of 1927, when the Supermarine-Napier S.5, with its geared engine, marked a great step in advance; or of the last contest, when the Rolls-Royce "R" engine made its sensational appearance on the scene. This year Mr. Mitchell has had only a few months in which to make what improvements could be made within narrow limits to the design known as S.6. It is believed that within the limits imposed he has done wonders, and it is common knowledge that the type S.6 "B" is a much better seaplane even than the modified S.6 "A." Mr. Rowledge has also got a

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1931
- Sept. 12. "Model Engineer" Exhibition ends, Royal Horticultural Hall, Westminster.
- Sept. 12. Schneider Trophy Contest.
- Sept. 16. "Development of Aircraft Manufacturing," Wilbur Wright Memorial Lecture, by Glenn L. Martin, before R.Ae.S.
- Sept. 17. Opening of L.G.O.C. Flying Club at Broxbourne Aerodrome.
- Sept. 19. Manchester Air Pageant, Barton.
- Sept. 19. All-Women's Aviation Meeting at Northamptonshire Ae.C., Sywell.
- Sept. 19. Hull Ae.C. Meeting at Hedon Aerodrome.
- Sept. 20. Flying Meeting at Chateau des Ardennes, Belgium.
- Sept. 23-Oct. 11. French Two-Seater Light 'Plane Competition.
- Sept. 26. Garden Party, Bristol and Wessex Ae.C.
- Oct. 3. Cardiff Ae.C. Air Pageant at Splott Aerodrome.
- Oct. 3-4. International Gliding Competition, Balsaean, Sussex.
- Oct. 8. Balloon Ascent, Lecture by Prof. Piccard before R.Ae.S.
- Oct. 15. "Protection of Metals in Aircraft Construction," Lecture by H. Sutton before R.Ae.S.
- Oct. 29. "Accidents in Civil Aviation," Lecture by Capt. A. G. Lamplugh before R.Ae.S.
- Nov. 5. "Safety in Spinning," Lecture by H. B. Irving before R.Ae.S.
- Nov. 19. "Aircraft Vibration," Lecture by H. Constant before R.Ae.S.
- Dec. 3. "Wheel Brakes and Undercarriages," Lecture by S. Scott Hall before R.Ae.S.
- Dec. 10. "Air Flow—Demonstrations on the Screen by Means of Smoke," Lecture by W. S. Farren before R.Ae.S.
- Dec. 17. "Control Beyond the Stall," Lecture by Dr. G. V. Lachmann before R.Ae.S.

considerable amount of extra power out of the "R" engine.

Of the results of the research which the French put into their preparations for the contest but little is known. Italy is said to have attempted to make a great and sensational step forward by placing two engines tandem and driving both propellers through gears and shafts (one shaft running through the centre of the other), both propellers running in opposite directions close together in front of the forward engine. The Schneider contest has in its time provoked many novel ideas, and we applaud attempts to develop novel ideas even when they do not result in winning the trophy. Flying would never have made progress if men had not indulged in originality, and made attempts which could hardly command immediate success. Italy, as the country which brought the trophy back to Europe in 1926, and as the home of numerous original attempts to find new methods of increasing speed, has played a worthy part in the history of the Schneider.

The third aspect of the Schneider contest is commercial. Every aircraft-building nation desires to sell its products abroad. That nation which has for the time held the Schneider trophy has always had a strong recommendation in the world's aircraft markets. One concrete case which well illustrates this is the history of the Curtiss D.12 engine which won the contest of 1923. It made such an impression on British constructors by reason of its small frontal area that the British rights were acquired by the Fairey Aviation Co., Ltd., the "Fox" aeroplane was specially designed for this engine, and an order for 30 of the engines was immediately placed with the Curtiss firm. This was perhaps an exceptional case. As a general rule the effects of a win in the Schneider are more indirect. Nevertheless, it is generally and rightly held that the nation which can win the Schneider trophy possesses the best designers of the time.

One more aspect of the Schneider contest may be mentioned. It is a test of ability in organisation and production. A nation cannot win unless its machines have been produced and tested by a certain date which has been fixed months before. This organisation implies the spending of a large sum of money. In 1927 and 1929 the British organisation could hardly have been bettered. This year the money was not forthcoming from the national exchequer, and for a time it appeared that Great Britain, the holder of the trophy, would be put to shame before the eyes of all nations. Fortunately, Great Britain is not wanting in public-spirited citizens, and this year one of them came to the rescue. All honour should be paid to Lady Houston, whose munificent gift of £100,000 has saved the credit of her country in the air. From that point on, we feel that we have nothing of which to be ashamed. The firms of Supermarine and Rolls-Royce did what they undertook to do within the very short time allowed to them, and a full week before the date of the contest our High-Speed Flight was in possession of three racing seaplanes which they believed would be good enough to hold the trophy for Great Britain. The seaplanes, it is true, are not an entirely new design. They are the development of an old

one. But, had it not been for Lady Houston, the Italians and French might have sent over machines even still less modern, and one or the other might possibly have carried the trophy away across the English Channel.

As things stand, our rivals have both had to confess that after two years of preparation they have not been able to produce machines by the appointed date which they think would have any chance of making a creditable show in a contest with the British machines.

This is a great triumph of British design and production. We are well aware that we are writing before the contest has taken place, and we know only too well that accidents are possible. Still, we hardly think it credible that none of our three seaplanes will be able to complete the navigability tests and fly round the speed course on next Saturday. Even if that very unlikely event were to happen, it would still be true that neither of our challengers thought it worth while to attempt to redeem the gauge which she had cast down. On the other hand, if all goes well on Saturday, we shall justly be able to plume ourselves on the triumph of our designers. If all our three machines complete the course successfully, then we shall be able to say that in three successive Schneider contests only one British machine has been forced to land. The flying world could not fail to take note of such a record.

At the moment of writing we are not aware of the instructions which are to be issued by the Schneider committee to the High-Speed Flight. The Air Ministry has stated that if the first machine which is sent off performs to the satisfaction of the committee in the matter of speed, no other machine will start. The Schneider committee had still to consider and decide on that statement. By the time these words appear in print the decision will be known. We hope that all three machines will be sent round the course as a demonstration of the completeness of our preparations made in a very short time. As a secondary consideration, that would provide a much more satisfactory spectacle to those who turn up to watch the flying. Naturally there will not be such large crowds as there would have been if either or both foreign teams had put in an appearance, but still a number of enthusiasts will be keen to see the high speed of the machines in the air. Three machines will make a better sight than one, even though that one may fly faster than man has ever travelled before.

Supposing that the Schneider trophy will now remain permanently in Great Britain, and that the real victors this year are Mr. Mitchell and Mr. Rowledge, our thoughts turn to those who have worked in the past to bring about this result. The Napier engine has won two contests, in 1922 and in 1927. The Gloster firm are the pioneers of high-speed work in Great Britain, and have scarcely received due credit for all the work they have done. High-speed flying dates from the appearance of the "Bamel," which, if it had been put on floats, might have saved the trophy for Great Britain against the American invasion of 1923. It is bad luck that no Gloster seaplane has ever won. To all the pioneers the grateful thanks of the nation are undoubtedly due.

HISTORY OF THE SCHNEIDER TROPHY CONTESTS

IN view of the fact that the twelfth contest for the Schneider Seaplane Trophy, to be held over Spithead on Saturday next, September 12, will be the last of the series, due to the winning by Great Britain of three out of five consecutive contests, it is thought that a brief history of the Schneider Contests may be of interest to readers of FLIGHT, and an outline of the events, as well as a table showing the winners and their speeds, in the various years will therefore be found in the following pages.

On December 5, 1912, at the Gordon-Bennet Banquet of the Aero Club of France, it was announced that M. Jacques Schneider, a well-known French sportsman and a member of the famous French armament firm, had offered through the Aero Club of France a trophy valued at 25,000 francs for an international competition, to be called The "Coupe d'Aviation Maritime Jacques Schneider," to be competed for by international challenge according to regulations approved by the F.A.I. M. Schneider also gave a further 25,000 francs to the promoting club for three successive annual contests, the first of which was to be held under the auspices of the Aero Club of France.

1913

The first contest for the Schneider Trophy was organised by the Aero Club of France, and was held at Monaco during the International Seaplane Competitions (or, as they were then called, Hydro-Aeroplane Competitions) being held there from April 3 to 16. Only two countries were represented, France and America. America was represented by Mr. C. T. Weymann on a "Nieuport" twin-float monoplane fitted with 100-h.p. Gnome rotary engine. France sent several entries, including two "Breguets," two "Nieuports," two "Deperdussins," one "Borel" and one "Morane."

The course consisted of 28 laps of a 10-km. circuit, or a total distance of 280 km.

The 1913 contest was won by M. Prevost on a "Deperdussin" twin-float monoplane fitted with 160-h.p. Gnome engine. Prevost completed the course in 2 hr. 50 min. 47 sec., but in finishing he omitted to cross the line, and by the time he could get into the air again and cross the line, considerable time had been lost, and his official time then became 3 hr. 48 min. 22 sec., which brought his average speed down to 45.75 m.p.h. (72.6 km./hr.).

As France was the winner of the 1913 contest, the Aero Club of France was entrusted with the organisation of the second Schneider Contest, which, like the first, was held at Monaco in 1914. The course was again one of 28 laps of a 10-km. circuit, and five countries entered machines for the contest, viz., Great Britain, France, Germany, Switzerland and U.S.A.

The 1914 contest resulted in a magnificent win for Great Britain by Mr. Howard Pixton on a Sopwith twin-float biplane fitted with 100-h.p. Gnome engine. Pixton completed the course in 2 hr. 0 min. 16 sec., his average speed being 139.7 km./hr. (86.8 m.p.h.).

1919

During the war period 1914-1918 the Schneider Contest was abandoned, and the first Schneider Contest after the war was held at Bournemouth and organised by the Royal Aero Club of the United Kingdom, Howard Pixton having won the trophy for England in 1914.

Three countries were represented in the 1919 Schneider Contest at Bournemouth, viz., Great Britain, France and Italy.

The eliminating trials were held off Cowes on September 8, and the actual contest was to have taken place off Bournemouth on September 10. On that date, however, a thick mist hung over the sea, and conditions were extremely unfavourable for the holding of such a contest. Competitors lost their way, others damaged their machines and had to retire, and altogether the 1919 contest was a failure. One of the Italian competitors, Janello, on a Savoia S.13 flying boat, fitted with 250-h.p. Isotta-Fraschini engine, was believed at the time to have completed the course correctly, and was for a time considered the winner, but later it was reported that he had not been seen by one of the mark boats which formed the turning points, and consequently the 1919 contest was ultimately declared void. As a token of appreciation of the way in which Janello had flown his machine under extremely bad weather conditions, it was, however, decided to entrust to Italy the organisation of the next contest.

1920

The fourth Schneider Trophy Contest, held at Venice in 1920, was almost as unsatisfactory as that held the previous year at Bournemouth. There were no British entries for the contest, and France, who had entered, withdrew her entry at the last minute. This left Italy alone in the field, and Italy secured the trophy by Bologna flying over the course on September 21 in a Savoia S.19 flying boat fitted with 500-h.p. Ansaldo engine. The course was a triangular one of 20 sea miles, and the regulations for the 1920 contest demanded

that this course should be flown ten times, giving a total distance of 200 sea miles. Bologna completed the course at 172.5 km./hr. (107 m.p.h.).

1921

The fifth Schneider Contest was nearly as much of a failure as had

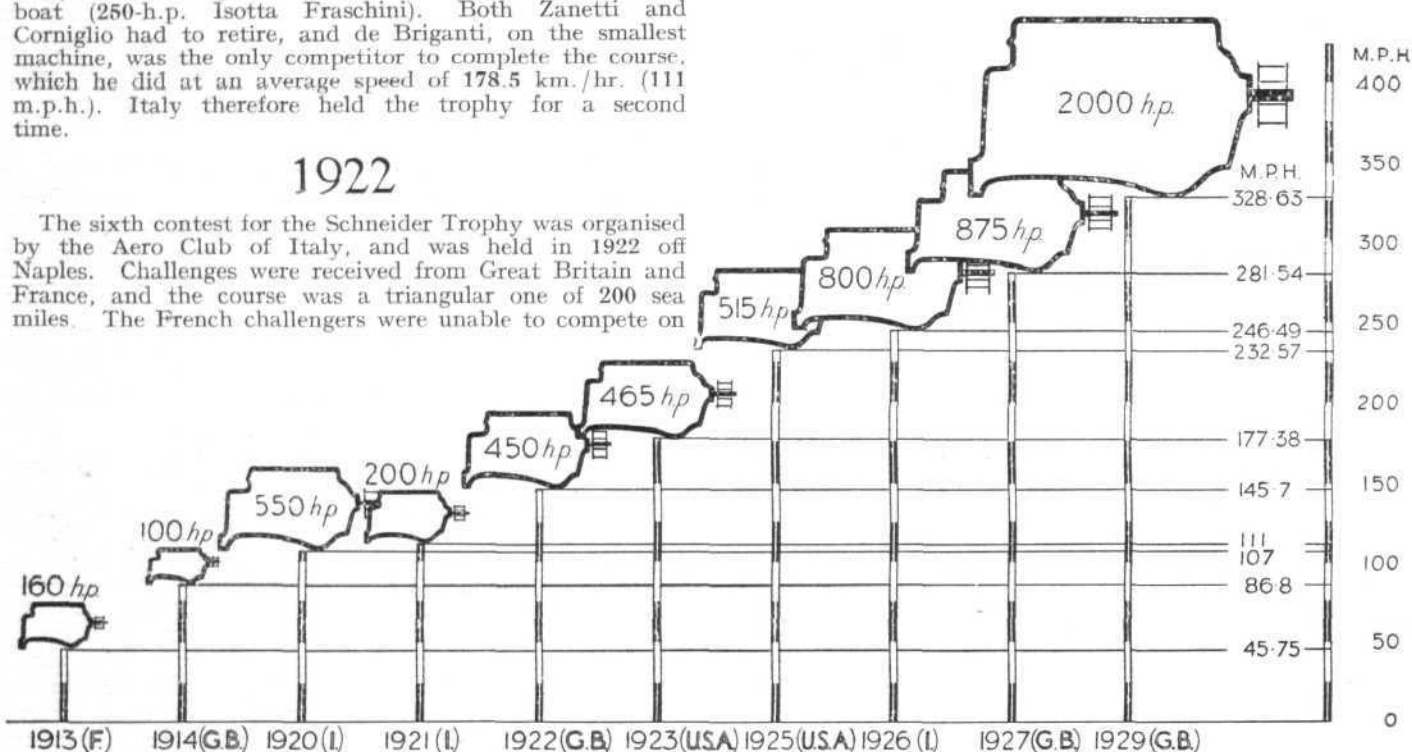


been the previous two. There were no challengers from Great Britain, and France challenged with only one machine, a "Nieuport Delage" twin-float biplane (300-h.p. Hispano Suiza), piloted by Sadi Lecoq. Unfortunately, Lecoq met with a mishap during a test flight prior to the contest, and once more Italy was left the only competitor.

On September 7 the three Italians proceeded to "fly over." The Italian team consisted of de Briganti on a "Macchi VII" flying boat (200-h.p. Isotta Fraschini); Zanetti, on a larger "Macchi XIX" flying boat (700-h.p. Fiat); and Corniglio, on another "Macchi" naval flying boat (250-h.p. Isotta Fraschini). Both Zanetti and Corniglio had to retire, and de Briganti, on the smallest machine, was the only competitor to complete the course, which he did at an average speed of 178.5 km./hr. (111 m.p.h.). Italy therefore held the trophy for a second time.

1922

The sixth contest for the Schneider Trophy was organised by the Aero Club of Italy, and was held in 1922 off Naples. Challenges were received from Great Britain and France, and the course was a triangular one of 200 sea miles. The French challengers were unable to compete on



"HORSES AND YET MORE HORSES": Diagrammatic representation of the way in which the power and speed of the winners of Schneider Contests has increased from 1913 to the present time.

the day of the contest, leaving Italy and Great Britain to fight it out between themselves.

There were three Italian defenders, and but a single British challenger. This was a Supermarine "Sea Lion II," a flying boat fitted with Napier Lion engine. This machine had been produced entirely by private enterprise by Mr. Hubert Scott Paine, who was then part owner of the Supermarine Aviation Works, and but for Mr. Scott Paine's enthusiasm and willingness to finance the undertaking, Great Britain would have been without a challenger.

The machine was piloted by Capt. H. C. Biard, who scored a magnificent victory by covering the course at an average speed of 234.5 km./hr. (145.7 m.p.h.).

1923

As a result of Biard's victory at Naples, the 1923 contest was held in British waters and organised by the Royal Aero Club of the United Kingdom. The site chosen was Spithead, the course having turning points off Cowes, Southsea and Selsey Bill. The 1923 course was one of 186 sea miles, and the contest was held on September 28.

There was an excellent entry list, the following countries being represented: France, Great Britain, Italy and the U.S.A.

Great Britain was represented by three machines: A Supermarine "Sea Lion III," fitted with Napier Lion engine; a Blackburn "Pellet," also fitted with Lion engine; and a Sopwith biplane, fitted with Bristol "Jupiter" engine. The latter machine was eliminated before the contest by its spinner coming adrift, causing a forced landing to be made, which resulted in considerable damage to the machine.

France was represented by two C.A.M.S. flying boats and a Latham twin-engined flying boat.

The United States of America were represented by two Curtiss Navy C.R.3 twin-float seaplanes with Curtiss D.12

engines, and a Navy Wright biplane with 300-h.p. Wright engine. The Navy Wright was eliminated before the contest by the breaking of its metal propeller, which damaged the floats.

For the first time in the history of the Schneider Contest, it was a case of a Government service against private enterprise, as the Americans had entrusted the organisation of their team to the American Navy, whose machines were very much faster than anything which Europe could put up against them, and it was thus not surprising when Rittenhouse won the contest at what was at the time

considered to be a phenomenal speed, i.e., 177.38 m.p.h. Biard put up a very splendid effort on behalf of England, but, although he covered the course at an average speed of 151.16 m.p.h., the Americans proved far too much for him, and the trophy went to the United States.

1924

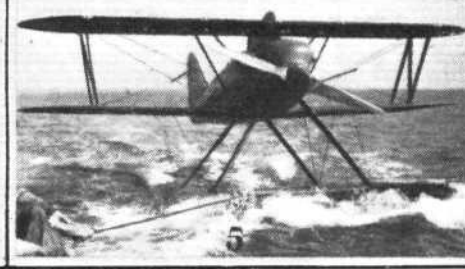
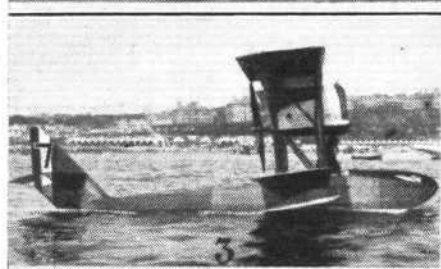
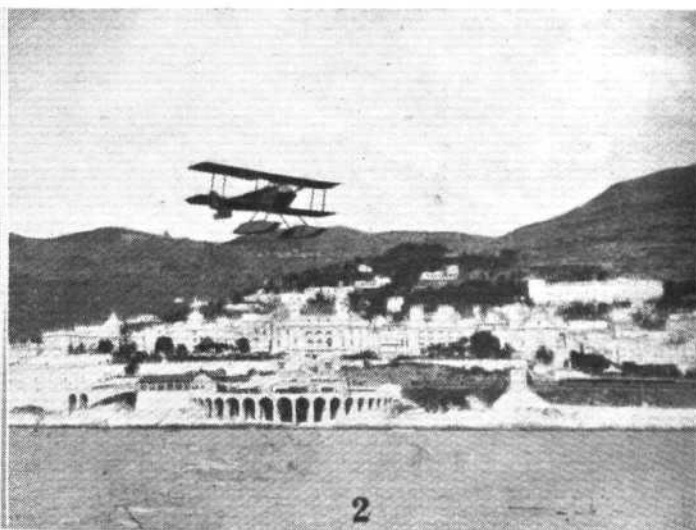
America having won the contest in 1923, it fell to the United States to organise the 1924 contest. Great Britain and Italy had challenged, but, as the British machine, a "Gloster Napier" biplane, was damaged during trials, it could not be sent to America, and Italy withdrew her entries, the American defenders were without opponents, and America very sportingly decided to call the contest off until the following year rather than to claim a "fly over." By this extremely sporting action America kept the contest alive, but, as it turned out later, she also lost for herself the chance of winning the trophy outright.

1925

The Schneider Contest postponed by America in 1924 was held off Baltimore in 1925, the United States being the defenders and Great Britain and Italy the challengers.

Great Britain was represented by a Supermarine Napier "S.4" twin-float monoplane, and a "Gloster Napier III" twin-float biplane, the former being piloted by Capt. H. C. Biard and the latter by Capt. H. Broad. A third string was a "Gloster III" machine with Bert Hinkler as pilot. Italy was represented by two machines, both "Macchi M.33" low-wing monoplane flying boats, fitted with 500-h.p. Curtiss D.12 engines, the pilots being de Briganti and Morselli. On the day of the eliminating trials Biard started for his tests, but the machine got out of control, and Biard had to make a landing as best he could, in which the machine sank, and Biard narrowly escaped drowning.

SOME SCHNEIDER TROPHY WINNERS



1, The first winner, M. Prevost, on a Deperdussin monoplane at Monaco in 1913. 2, Mr. Howard Pixton winning the contest in 1914 on a Sopwith biplane. 3, The Savoia flying boat flown by Janello in the 1919 contest at Bournemouth. 4, The Supermarine "Sea Lion" on which Captain Biard won the contest at Naples in 1922. 5, Lieut. Rittenhouse's Navy-Curtiss, winner in 1923 at Cowes. 6, Lieut. Jimmy Doolittle and the Army-Curtiss with which he won in 1925 at Baltimore. 7, Major de Bernardi and his Macchi monoplane, winner at Hampton Roads in 1926. 8, Webster's Supermarine-Napier S.5, winner of the 1927 contest at Venice. 9, The Supermarine-Rolls Royce S.6 on which Waghorn won the contest over Spithead in 1929.



AT VENICE IN 1927: Kinkead on the Gloster-Napier IV overtaking Worsley on the Supermarine-Napier S.5 direct drive machine. (FLIGHT Photo.)

Broad passed his eliminating trials, but Bert Hinkler, on the spare "Gloster III," failed on the first attempt, and on the following days the weather prevented Hinkler from completing his tests.

Lt. Doolittle, on an Army "Curtiss" twin-float biplane, with Curtiss D.12 engine, won the 1925 contest at a speed of 232.57 m.p.h., while Broad was second on the "Gloster Napier III" with a speed of 199.169 m.p.h.

1926

The United States having twice won the contest within three years, the ninth Schneider Trophy Contest held in 1926 would decide whether or not America would be able to retain the trophy permanently.

For a time it looked as though America would once again be left without challengers, as there were no British entries, and the Italian entries being doubtful starters. However, at the last minute Italy entered a full team, and the Schneider trophy was thus given a chance of another lease of life.

The 1926 contest was originally scheduled for October 24, but at the request of Italy it was postponed until November 11. The course was a triangular one of 50 km., and was laid over Hampton Roads, Newport News, Virginia. The course had to be covered seven times, giving a total distance of 350 km.

The defending American team consisted of three Navy "Curtiss" twin-float biplanes, flown by Lt. Cuddihy, Lt. Schilt and Lt. Tomlinson.

The Italian team was composed of Major de Bernardi, Capt. Ferrarin and Lt. Bacula, all flying "Macchi M.39" twin-float monoplanes fitted with 800-h.p. Fiat engines.

De Bernardi proved an easy winner, and completed the course of 350 km. at an average speed of 246.5 m.p.h. Lt. Schilt secured second place for the United States with a speed of 231.4 m.p.h.

1927

For the first time in the history of the Schneider Trophy Contest, Great Britain entered service machines and pilots for the 1927 contest, which was organised by the Aero Club of Italy and held off Venice.

Originally, two nations had challenged Italy, Great Britain and the United States of America, but the American machine, a private venture, fitted with Packard engine and to be piloted by Al Williams, was not completed in time to take part in the contest. This left Great Britain as the only challenger, with three machines in the actual contest, these being two Supermarine S.5 monoplanes, with Napier racing engines, and a "Gloster Napier IV," also fitted with Napier racing engine.

The Italian defenders were three "Macchi M.52" twin-float monoplanes fitted with Fiat engines.

The British pilots in the contest were Flt. Lt. Kinkead, Flt. Lt. Webster and Flt. Lt. Worsley. Kinkead was flying a "Gloster Napier IV," Webster a Supermarine S.5 fitted with geared Napier engine, and Worsley a Supermarine S.5 fitted with direct-drive Napier engine. Kinkead had to retire after his fifth lap, and ultimately Webster won the contest at a speed of 450.64 km./hr. (281.656 m.p.h.). Worsley was second with a speed of 439.47 km./hr. (272.96 m.p.h.). All three Italian defenders had to retire.

1929

After the 1927 Schneider Contest, held at Venice, it became evident that the difficulties and expense of the preparations were such as to make it advisable to hold the contest every other year instead of in consecutive years, and the next contest, organised by the Royal Aero Club of the United Kingdom, was therefore not held until 1929. The Royal Aero Club decided on a quadrilateral course over the Solent and Spithead, the course being 50 km. in length and, under the regulations in force, having to be flown seven times, giving a total distance of 350 km. (217.48 land miles).

Originally, no less than 10 machines had been entered, three by France, three by Great Britain, three by Italy and one by America. The American entry was, as in 1927, a private venture, with Lt. Al. Williams as the pilot, but it could not be perfected sufficiently in time to take part in the contest. France also was unable to complete her preparations, while for weeks before the contest Italy was a very doubtful starter. However, ultimately Italy did send a full team to challenge the British defenders, and the contest was held on the scheduled date, Saturday, September 7.

As in previous Schneider Contests, navigability trials had to be held on the day before the actual contest. These trials were originally introduced in order to weed out any "freak" machines which might have a good turn of speed, but would have no claim to seaworthiness. Machines were required to take off, fly over a short course on which were marked off two distances of one-half sea mile each, over which the machines had to taxi at not less than 12 knots. Immediately after these tests the machines had to be moored to buoys, where they were required to remain for six hours with no one on board and unattended. If a machine had sprung a leak during

the navigability and seaworthiness trials, and had to be removed from its buoy to prevent it from sinking, it would thereby be disqualified from taking part in the contest. All the six seaplanes passed the tests without trouble.

The 1929 Machines

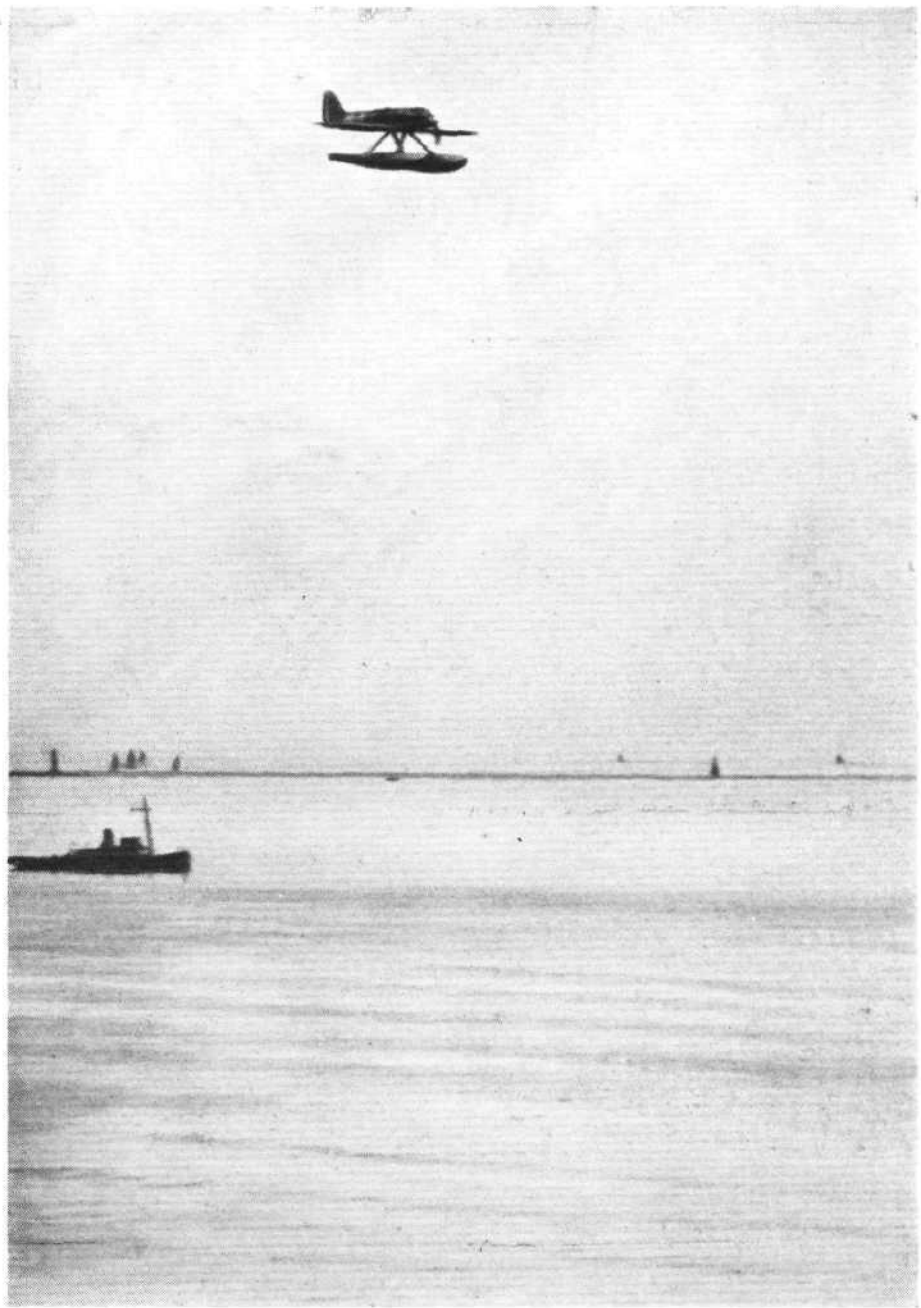
Four aircraft were ordered by the British Air Ministry for the 1929 Schneider Contest, two Supermarine S.6 all-metal monoplanes with Rolls-Royce "R" type racing engines, and two "Gloster VI" monoplanes with Napier racing engines. As each country is entitled to send but three machines into the contest, this meant three machines to be selected, with one in reserve. The Supermarine S.6 machines were ready first, and but for certain minor troubles with porpoising tendencies, which were overcome, required practically no modifications. The "Gloster Napier VI" monoplanes were completed rather later, and when they came to be tested, certain troubles with the induction were encountered. It will be realised that high-speed forced induction racing engines are liable to be very sensitive to such items as size and arrangement of air intakes, not to mention the considerable difficulties which may be encountered in the operation of blowers for forcing into an engine a larger amount of charge than the engine would normally aspirate. Time was too short for remedying these difficulties, and the two "Gloster Napier VI" monoplanes had to be left out of the contest. This was a cause for the most sincere regret, as the Gloster and Napier companies had always been well to the fore in racing aircraft, and had done a great deal towards maintaining British prestige in this direction. However, there was no help for it, and one of the Supermarine-Napier S.5 monoplanes built for the 1927 contest was nominated to take its place in the team as third machine.

The 1929 Supermarine Rolls-Royce S.6 was an all-metal twin-float monoplane, with the wing placed low on the fuselage, and braced by streamline wires to top of fuselage and to floats. Fuel was carried in the floats, and was lifted to a small gravity tank by engine-driven pumps. As the distance which the fuel had to be lifted was considerable, and as centrifugal force during a turn is such as virtually to double or treble that distance, the pumps would fail to supply the necessary quantity of fuel during a turn, and the gravity tank in the fuselage was relied upon to supply the engine during a sharp turn, until the pumps were able to resume their work when the machine straightened out.

The wing surface radiators were a new feature, and were made as the wing covering. They consisted of two thicknesses of Duralumin with a very narrow waterway between them.

The lubricating oil was cooled by being passed along specially constructed oil coolers forming the sides of the fuselage. The oil tank was housed in the vertical tail fin, which, being in the propeller slipstream, contributed considerably to the cooling.

The 1929 Supermarine S.6 machines had a wing span of 30 ft., a wing area of 145 sq. ft., and weighed 4,030 lb. empty. They carried in the contest, in addition to the pilot, 115 gallons of petrol and 10 gallons of oil, and a certain quantity of cooling water, which brought the gross weight up to 5,250 lb. and gave a wing loading of 36.2 lb./sq. ft. During the race the Rolls-Royce engines were giving 1,900 h.p., so that the power loading became 2.76 lb./h.p. only.



THE WINNER: Flt.-Lt. Webster crossing the finishing line on the Supermarine-Napier S.5 at Venice in the 1927 Contest. (Flight Photo.)

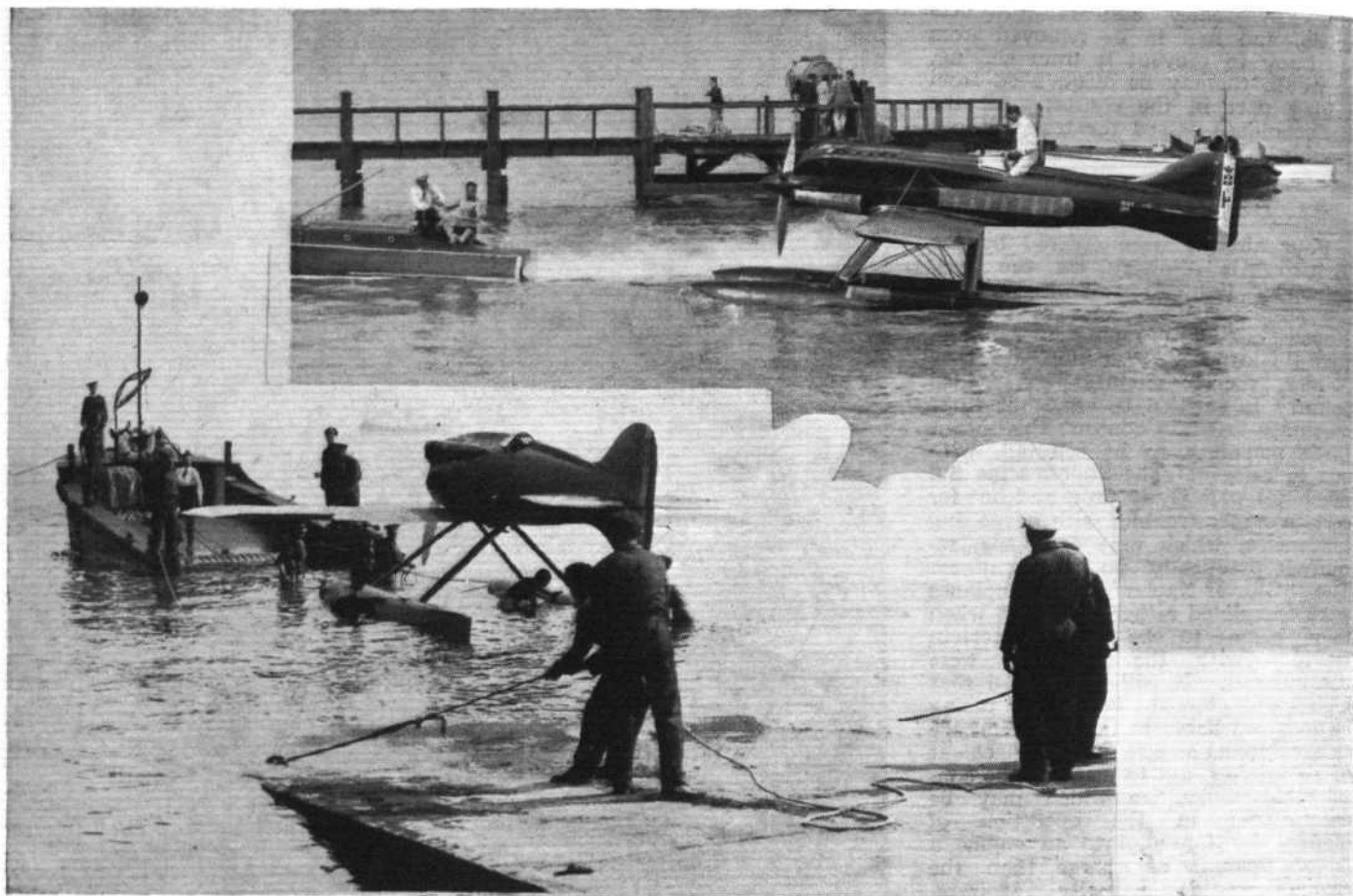
Developed from the 825-h.p. Rolls-Royce "H" engine, the Rolls-Royce "R" engines of 1929 were 12-cylinder water-cooled engines with the cylinders placed at an angle of 60 degrees to each other. They had a cylinder bore of 6 in., and a stroke of 6.6 in., and weighed 1,535 lb., which gave a specific weight of only 0.805 lb./h.p. A special supercharger of entirely novel design was developed for these engines, and proved entirely successful. Small frontal area was another feature which contributed to their success, while a reduction gear gave very high airscrew efficiency.

The machines sent by Italy included two Macchi M.67 monoplanes, a Macchi M.52 monoplane, a Savoia-Marchetti S.65 twin-engined monoplane and a very diminutive Fiat low-wing monoplane.

After various troubles and tribulations with the latest types, the captain of the Italian team was obliged to nominate for the actual contest the two Macchi M.67 machines and the old Macchi M.52, on which de Bernardi had established a world's speed record some time before.

The 1929 Contest

The six pilots and their machines, in the order of starting, were: 1, F/O Waghorn, Supermarine Rolls-Royce S.6; 2, Marshal Dal Molin, Macchi M.52 (Fiat); 3, Flt. Lt. D'Arcy Greig, Supermarine-Napier S.5; 4, Tenente Cadringher, Macchi M.67 (Isotta-Fraschini); 5, F/O Atcherley,



ITALIAN CHALLENGERS IN THE 1929 CONTEST: Above, the Macchi M.67, and below the Macchi M.52. The latter, an old type, was the only Italian machine to finish the course. (FLIGHT Photos.)

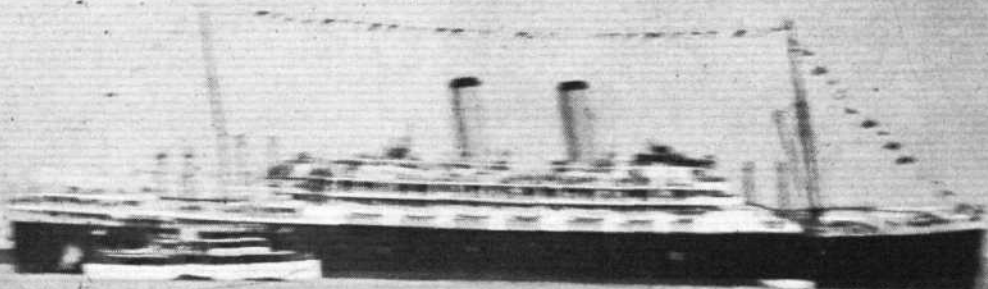
SCHNEIDER TROPHY WINNERS

The winners and their speeds in the previous contests are as follows:—

Year	Nations Represented	Winning Country	Place of Contest	Pilot	Seaplane	Engine	Distance, nautical miles	Speed, kilometres per hour	Speed, miles per hour
1913	F., U.S.A.	France	Monaco	M. Prevost	Deperdussin	160-h.p. Gnome	150.0	72.6	45.75
1914	F., G., G.B., S., U.S.A.	Great Britain	Monaco	C. Howard Pixton	Sopwith	100-h.p. Monosoupape	150.0	139.7	86.8
1915-18	No contests.								
1919	F., G.B., I.	Contest declared void	Bournemouth	Contest declared void. (Owing to fog, the race was declared void, as only one Italian machine flew round, and it was not observed throughout. Italy was made responsible for organising the next contest.)					
1920	I.	Italy	Venice	Luigi Bologna	Savoia S.19	550-h.p. Ansaldo	202.0	172.5	107.0
1921	F., I.	Italy	Venice	G. De Briganti	Macchi VII (Flying Boat)	200-h.p. Isotta Fraschini	200.0	178.5	111.0
1922	F., G.B., I.	Great Britain	Naples	Capt. H. C. Biard	Supermarine "Sea-Lion" Flying Boat	450-h.p. Napier Lion	200.2	234.5	145.7
1923	F., G.B., I., U.S.A.	United States	Cowes	Lt. D. Rittenhouse	Curtiss Navy Racer C.R.3	465-h.p. Curtiss D.12	186.0	285.4	177.38
1924	No contest.								
1925	G.B., I., U.S.A.	United States	Baltimore	Lt. J. Doolittle	Curtiss Army Racer R.3, C.2	Curtiss V.1400	188.86	374.2	232.57
1926	I., U.S.A.	Italy	Hampton Roads, U.S.A.	Major M. de Bernardi	Macchi M. 39 monoplane	Fiat 800 h.p.	188.86	396.6	246.496
1927	G.B., I.	Great Britain	Lido, Venice	F/Lt. S. N. Webster, R.A.F.	Supermarine-Napier S.5	Napier Lion VII C., 900 h.p.	188.86	450.64	281.656
1929	G.B., I.	Great Britain	Ryde, Isle of Wight	F/O. H. R. D. Waghorn, A.F.C., R.A.F.	Supermarine Rolls Royce S.6	Rolls Royce "R," 1,900 h.p.	188.86	528.87	328.63

The world speed record for seaplanes on the three kilometre straight course is held by Sqdn.-Ldr. A. H. Orlebar, A.F.C., R.A.F., who achieved a speed of 575.65 km./hr. (357.7 m.p.h.) on a Supermarine Rolls Royce S.6 seaplane at Calshot, Southampton, on September 12, 1929. The speed record for 100 kilometres of 331.75 m.p.h. is held by Flt.-Lt. R. L. R. Atcherley, R.A.F. This was also accomplished on an S.6 seaplane on September 7, 1929.

F. = France; G = Germany; G.B. = Great Britain; I. = Italy; S. = Switzerland; U.S.A. = United States of America.



THE WINNER OF THE 1929 SCHNEIDER TROPHY CONTEST: Flying Officer Waghorn (inset) crosses the finishing line over the Orient Liner "Orford" after having covered the course at an average speed of 328.63 m.p.h. He was flying a Supermarine Rolls-Royce S.6 monoplane fitted with Rolls-Royce "R" engine. (FLIGHT Photos.)

Supermarine Rolls-Royce S.6; 6, Tenente Monti, Macchi M.67 (Isotta-Fraschini).

The contest resulted in a splendid victory for Great Britain, F/O Waghorn averaging the astounding speed of 528.87 km./h. (328.63 m.p.h.). F/O Atcherley narrowly escaped missing turning points, due, it was afterwards stated, to his goggles having blown off, thereby confining his view to such oblique glimpses as he could catch through the tiny windows in the sides of the windscreen. For all that, Atcherley's machine proved faster on certain laps than Waghorn's, and during the contest Atcherley established two new world's speed records in a closed circuit, one over the 50 km. and the other over the 100 km. (two laps of the course). Atcherley's speed during his seventh lap of the course was 535.31 km./h. (332.49 m.p.h.), and his average speed in the sixth and seventh laps was 535.04 km./h. (331.7 m.p.h.)

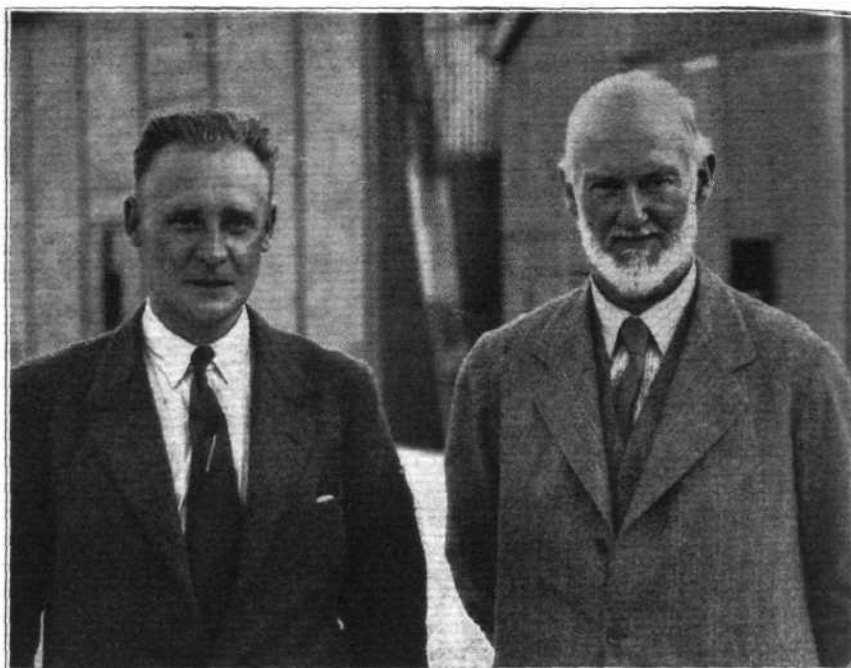
Britain's third string, Flt. Lt. D'Arcy Greig on the 1927 Supermarine-Napier S.5, averaged 282.11 m.p.h. over the whole course, all three British machines completing the total distance.

Two of the Italian competitors, both on Macchi M.67 monoplanes with Isotta-Fraschini engines, had bad luck in the contest. Lt. Cadringer suffered so severely from the effects of engine exhaust fumes that he had to retire, while Lt. Monti had to retire on his second lap, an oil pipe having broken and the pilot being badly scalded. In spite of this, however, he was able, by a piece of excellent piloting, to effect a safe alighting, greatly to everyone's relief.

Orlebar Establishes a World's Record

A few days after the 1929 Schneider Trophy Contest, on September 10 to be precise, Sqd. Ldr. Orlebar established a new world's speed record over the 3-km. straight-line course in Southampton Water by putting up an average speed in four runs of 355.8 m.p.h. A short time earlier, on the same date, Flt. Lt. Stainforth had beaten the then existing record by covering the 3-km. course twice in each direction at an average speed of 336.3 m.p.h. This was on the "Gloster Napier VI" monoplane.

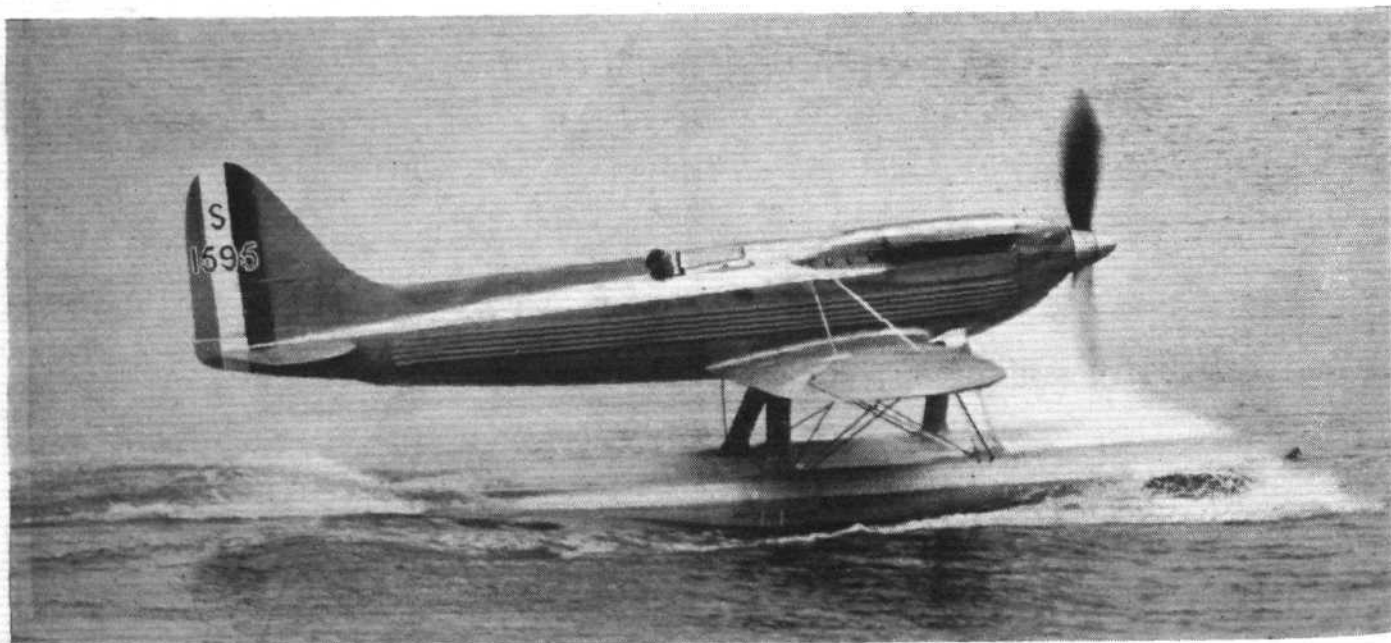
Not satisfied that the speed of 355.8 m.p.h. was quite the best of which the Supermarine Rolls-Royce S.6 was capable, Sqd. Ldr. Orlebar, who was captain of the 1929 Schneider Team and is captain again this year, once more made an attempt over the straight-line course in South-



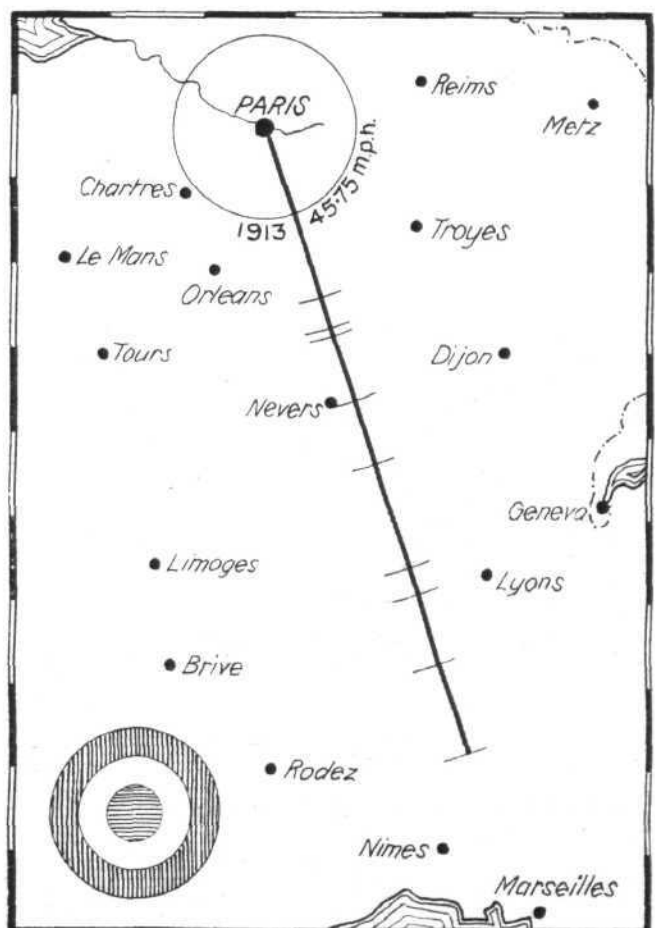
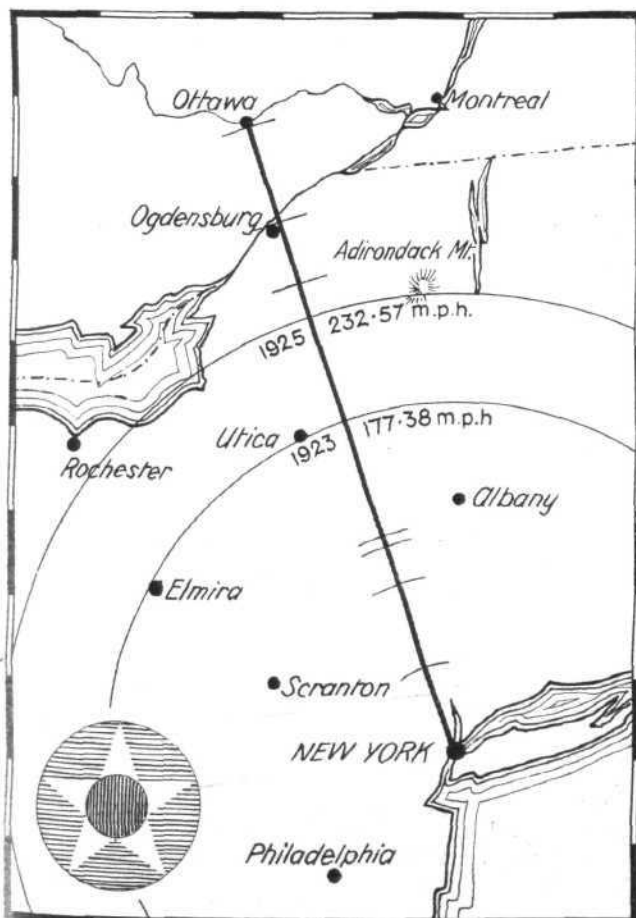
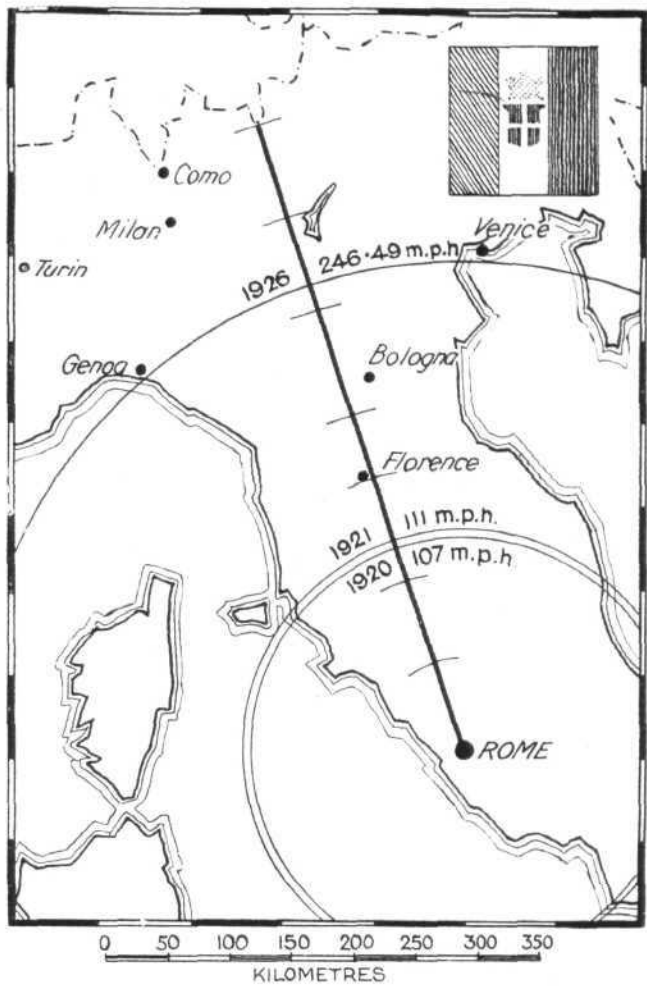
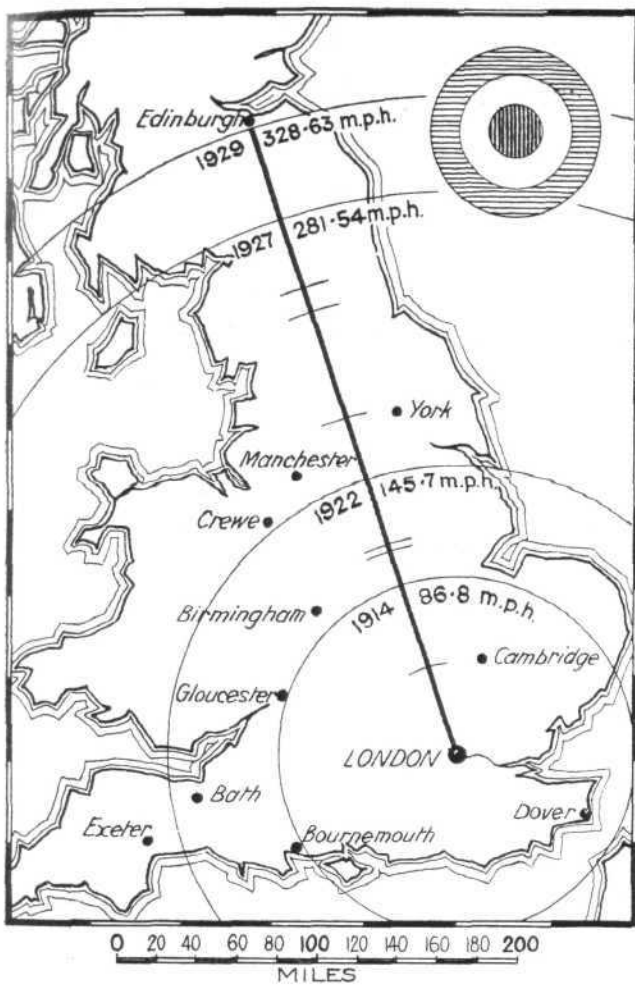
RESPONSIBLE FOR THE TECHNICAL SIDE: On the left Mr. R. J. Mitchell, chief engineer and designer to the Supermarine Aviation Works, who designed and built the S.6 and S.6B. machines. On the right Sir Henry Royce, the famous veteran designer of the Rolls-Royce firm, and responsible, with Mr. A. J. Rowledge, for the "R" engine. (FLIGHT Photo.)

ampton Water, and this time succeeded in raising his average speed to 576 km./h. (357.7 m.p.h.). This record flight took place on September 12, and the record still stands. It is, however, likely to be beaten by one of the 1931 Supermarine Rolls-Royce S.6B machines after the Schneider Contest on September 12.

It would have been a very fitting conclusion to the series of Schneider Trophy Contests if arrangements could have been made for one of the S.6B machines to be got ready for the straight-line record over the Southampton Water course on the day of the contest, as the result could then have been announced through the loud speakers installed at various points along the Schneider course. This, however, will scarcely be possible, as it is likely that both the new machines will be flying over the Schneider course. But as soon as possible afterwards, probably in a few days after September 12, we may expect the attempt to be made.



POSSIBLY THE LONE DEFENDER: The Supermarine S.6B., S.1595, may be the only machine to be sent over the Schneider course. (FLIGHT Photo.)



WHAT THE SCHNEIDER SPEEDS MEAN: Diagrammatic representation of the distances which the Schneider winners in the various years could have covered in one hour at the speeds at which the contests were won. (FLIGHT Copyright).



SCHNEIDER TROPHY CONTEST

1931

As a result of F/O. Waghorn's victory in 1929, the 1931 Schneider Trophy Contest has been organised this year by the Royal Aero Club of the United Kingdom, and will take place (weather permitting) on Saturday next, September 12. The Royal Aero Club formed a Schneider Committee to organise this year's contest, the committee being composed of representatives of the Royal Aero Club, the Air Ministry, the Royal Air Force and the Society of British Aircraft Constructors. This committee selected Spithead and the Solent as the most suitable site for the contest, these waters being somewhat sheltered from the prevailing winds, while the Royal Air Force Base at Calshot has unique accommodation for the competing machines.

1931 Regulations

Under the regulations in force this year, the navigability and seaworthiness trials, as well as the six hours' mooring tests, have been abandoned, and for the first time in the history of the contest the preliminary tests have to be carried out on the same day as, and immediately preceding the actual contest. The preliminary tests consist in taking off and cruising around for a few moments at a height sufficient to show that the machine is actually flying, then alighting and taxiing for a period of two minutes, followed by a take-off for the start of the actual contest. The two minutes' taxiing may be done as part of the run to take-off for the contest, and it is not necessary for competitors to cross the starting line in flight, although they will naturally do so to avoid losing time on the first lap.

The preliminary trials will take place in the area set aside for the purpose, and which lies west of the Schneider course (see map on p. 905). Each competitor is allowed 30 minutes in which to carry out the preliminary trials. If he is still within the area at the end of that period, he will be deemed to have failed, and must retire from the contest.

As soon as he has completed the preliminary trials, a competitor will make for the starting line at Ryde Pier. This, as already said, may be crossed either taxiing or in flight. In order to discourage diving, competitors must not approach the starting line from a height greater than 1,000 ft. After entering the course at Ryde Pier competitors fly seven circuits of the triangular course, which is one of 50 km., so that the total distance to be covered is 350 km., or 217.48 land miles (188.86 sea miles). The turning points in Saturday's Schneider Contest are situated

as follows:—The western turning point is a pylon erected on a destroyer anchored on Ryde Middle Shoal. The eastern turning point is a pylon erected on the foreshore at West Wittering, just east of the entrance to Chichester Harbour. The southern turning point is a pylon erected on a destroyer anchored off St. Helen's Point, Isle of Wight. Competitors will fly the course in an anti-clockwise direction, *i.e.*, after crossing the starting line at Ryde Pier they will head for the southern turning point, then for the eastern, and then for the western, after which they will again fly towards Ryde Pier.

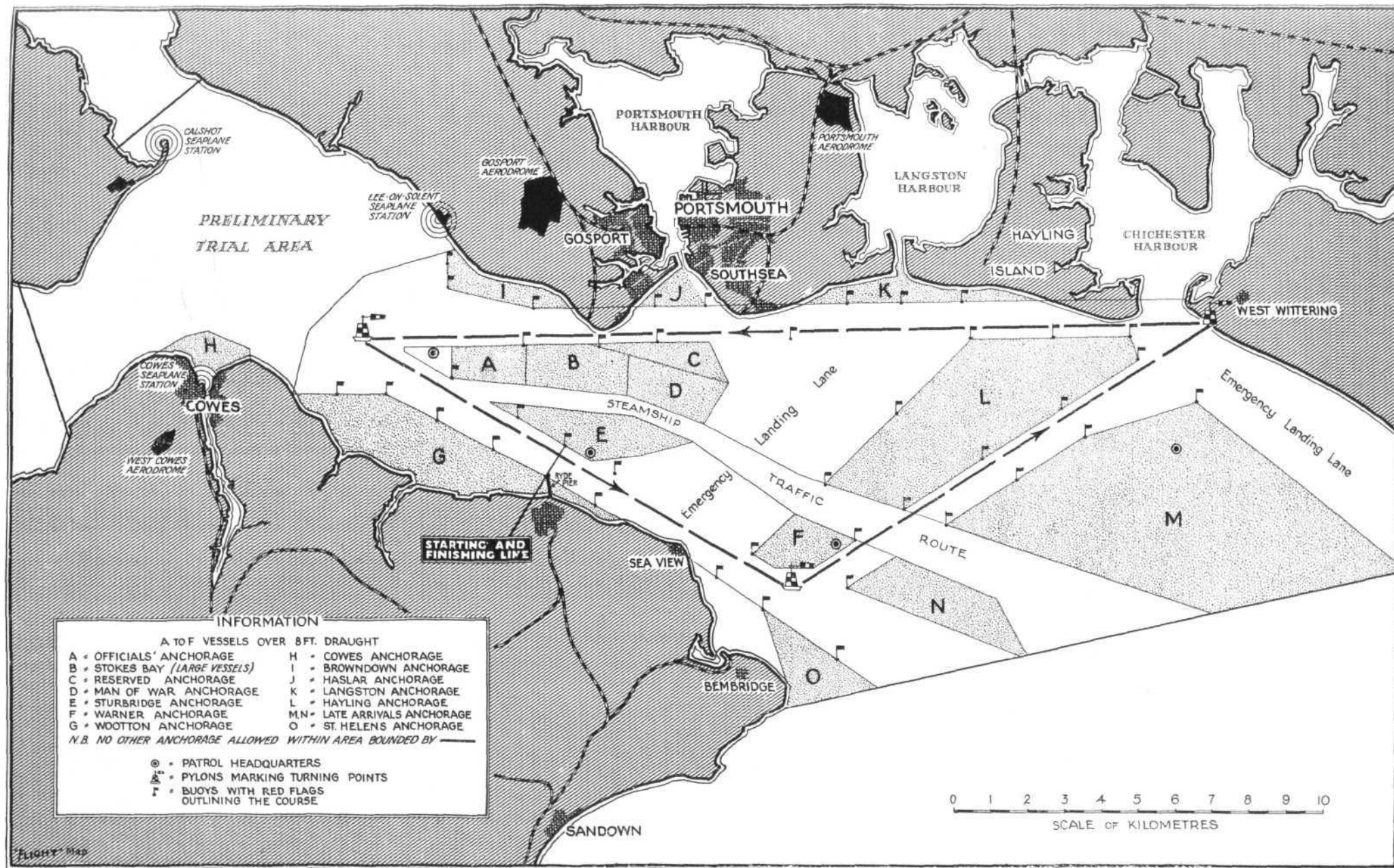
For the benefit of those of our readers who may possess stop watches and who desire to do a little amateur timing, we give a table of lap times and lap speeds. It should be explained that only the figures printed in italics have been calculated. The intermediate figures have been read off a graph plotted from the 10-second interval figures, and consequently they are given to one decimal place only. The figures are, however, likely to be at least as accurate as the timing done by amateurs.

The New British Machines

In spite of the fact that at the banquet held on board the *Orford* after the 1929 Schneider Contest, Mr. Ramsay MacDonald stated that if Great Britain was challenged she would build defenders, the Government announced early this year that no Government support would, after all, be given to the building of new machines, nor would Service pilots be made available to fly any new machines that might be produced. This would have meant that Great Britain would have been unable to defend the Schneider Trophy this year with other than old machines. Fortunately, Lady Houston came forward with a magnificent offer of £100,000 towards the expense of building new machines and engines, and in view of this very sporting and patriotic action the Government decided to sanction Service participation.

Orders were then placed with the Supermarine Aviation Works (which are now allied with Vickers (Aviation), Ltd., for two new aircraft, and with Rolls-Royce, Ltd., for new engines. At the same time, it was decided to modify the existing S.6 machines so as to fit them for the rather more severe conditions of this year's contest, in which the preliminary tests, as already mentioned, must be carried out immediately before the start of the actual speed test around the course.

The two new machines built for this year's contest may be identified by the numbers S.1595 and S.1596, painted



THE 1931 SCHNEIDER TROPHY COURSE: By having a triangular course the number of turns is reduced, but on the other hand some of the turns are sharper than those of the four-sided course of 1929.

on the rudders. They are known by the type letters S.6B, whereas the modified 1929 machines are now referred to as the type S.6A. The modified machines carried the numbers N.247 and N.248. Of these two, N.247 won the contest in 1929, piloted by F/O Waghorn, and also held the world's speed record over the straight-line 3-km. course. It was this machine on which Lt. G. L. Brinton, R.N., was killed a short time ago while attempting to take off for a practice flight. There remain to take part in Saturday's contest the two new machines S.1595 and S.1596, and the modified 1929 type, N.248. The latter is the machine flown by Atcherley in the 1929 contest, when a world's speed record over the 50-km. and 100-km. closed circuit was established.

In this year's contest the three British machines will carry the numbers 1, 4 and 7. These numbers, it might be explained, are a result of the draw for order of starting, carried out while it was still expected that France and Italy would take part. These numbers will be retained, and No. 1 is the S.6B, S.1595; No. 4 is the S.6A, N.248; while No. 7 is the S.6B, S.1596.

The S.6B machines, built specially for this year's contest, resemble closely the 1929 machines in their general lines and construction. At the moment it is not thought desirable to give too detailed particulars of the new machines, but the chief points of difference between them and the 1929 machines may be summarised as follows:

The Rolls-Royce engines have had their power increased considerably without any material increase in weight. Provision has been made in the machines for carrying greater loads of fuel, oil and water. A more efficient cooling system has been designed, and the water cooling surface has been increased, as has also the efficiency of the wing surface radiators. The distribution of the fuel in the two floats has been altered so as to counteract the very severe engine torque. The floats have been redesigned so that their aerodynamic drag is a good deal lower than that of the floats in the 1929 machines. The control surfaces have been mass-balanced in order to reduce the risk of flutter. New airscrews (of metal) have been produced by the Fairey Aviation Co., Ltd., for the more powerful engines used in this year's machines. To design and manufacture airscrews which will efficiently deal with more than 2,000 h.p. is obviously no easy task, but there has been no suggestion of propeller troubles with the 1931 Schneider machines.

The Rolls-Royce Engines

No official information has been made available relating to the new engines produced for this year's Schneider Trophy Contest. It is quite obvious, however, that in the time between the definite official decision to participate in the contest and September 12, i.e., seven months, there can have been no opportunity to produce entirely new types of engines. The production of a new engine is a very much longer and more costly business than the production of a new aircraft, and consequently it may be taken for granted that the engines produced by the Rolls-Royce Company for this year's machines are developments of the 1929 "R" type engines. It has been admitted officially that the new engines give a good deal more power than did the 1929 engines, and without drastically altering the engines, the

most likely way in which this increase in power can have been achieved is by an increase in the engine speed. The fact that the engines are geared should make this course permissible from an airscrew efficiency point of view, and if the reciprocating parts, bearings and so forth will stand up to the extra speed, there is no reason why the extra power may not be assumed to have been obtained in this way. Whether or not the degree of supercharging has been increased there are no means of knowing. It has, however, been stated that the increase in power is considerable, and that it has been achieved without any marked increase in weight.

The British Schneider Team

As originally formed, the British 1931 Schneider Team was composed as follows: Sqd. Ldr. A. H. Orlebar, A.F.C. (Captain of Team), Flt. Lt. F. L. Long, Flt. Lt. J. N. Boothman, Flt. Lt. G. H. Stainforth, Flt. Lt. E. J. Linton Hope, and F/O L. S. Snaith. Non-flying members of the team are Flt. Lt. W. F. Dry, who is Engineer Officer of the team, and F/O M. F. Tomkins, who is Stores Officer.

It may be recollected that Flt. Lt. Linton Hope had a crash while making a hurried landing after a practice flight. His place in the team was taken by Lt. G. L. Brinton, R.N., who was later killed while taking off in one of the 1929 machines (N.247).

Where to see the Contest

The fact that France and Italy have withdrawn from the contest will naturally rob the event of a good deal of its interest. The decision to send all three British Schneider machines over the course in accordance with the regulations should, however, ensure that the twelfth (and last if the fates are kind) Schneider contest should be well worth watching.

The present intention is that the starting signal for the first machine shall be given, as originally planned, at 12.30 p.m., the start of the other two machines following in the order of their numbers.*

The starting and finishing line is at Ryde Pier, Isle of Wight, and it will be from there that the machines will be timed over the seven laps of the course. Consequently Ryde Pier, and in fact a long stretch of the foreshore of the Isle of Wight, will provide good vantage points from which to watch the contest.

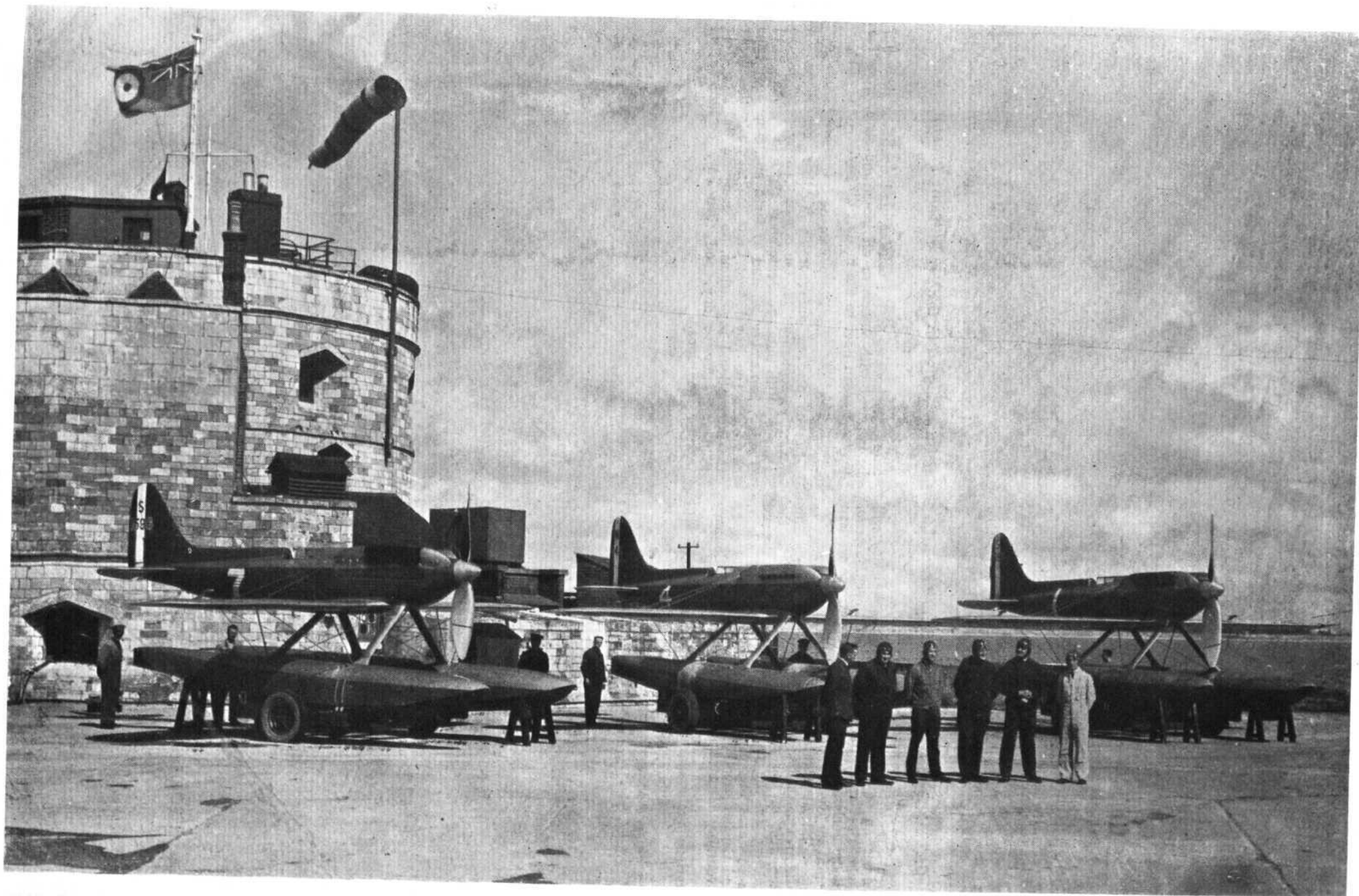
Along the Hampshire coast also there will be excellent opportunities for watching the exhilarating spectacle of machines hurtling along at some 350 m.p.h. At no point from the entrance to Chichester Harbour to Lee on Solent should spectators be very far away from the track followed by the machines, and Portsmouth town as well as Southsea are laying themselves out to provide accommodation for spectators. On South Parade Pier, Southsea, the Royal Aero Club has an enclosure for its members, and there are also enclosures for the general public, and car parks close to the pier.

At West Wittering, just to the east of the entrance to Chichester Harbour, where the eastern turning point is situated, there are a number of car parks from which a very excellent view of the machines should be obtained.

*Latest news is that only 1 machine may fly.

TABLE OF LAP TIMES AND SPEEDS.

Lap Time			Speed			Lap Time			Speed		
M.	s.		Km./hr.	M.p.h.		M.	s.		Km./hr.	M.p.h.	
5	0		600.00	372.24		5	46		520.2	322.9	
5	1		597.9	371.6		5	47		518.8	322.0	
5	2		596.1	370.1		5	48		517.3	321.1	
5	3		594.1	368.6		5	49		515.9	320.2	
5	4		592.1	367.5		5	50		514.32	319.25	
5	5		590.2	366.2		5	51		512.8	318.4	
5	6		588.2	364.9		5	52		511.3	317.4	
5	7		586.3	363.6		5	53		509.9	316.5	
5	8		584.8	362.4		5	54		508.5	315.5	
5	9		582.5	361.2		5	55		507.5	314.6	
5	10		580.61	360.09		5	56		505.6	313.8	
5	11		579.0	358.9		5	57		504.2	312.9	
5	12		577.0	357.8		5	58		502.8	312.0	
5	13		575.1	356.7		5	59		501.3	311.1	
5	14		573.2	355.5		6	0		500.00	310.20	
5	15		571.5	354.4		6	1		498.5	309.4	
5	16		569.7	353.3		6	2		497.1	308.5	
5	17		567.9	352.2		6	3		495.6	307.6	
5	18		566.1	351.1		6	4		494.4	306.7	
5	19		564.2	350.1		6	5		493.0	305.8	
5	20		562.85	349.19		6	6		491.6	305.0	
5	21		560.8	348.0		6	7		490.3	304.1	
5	22		558.9	346.8		6	8		489.0	303.2	
5	23		557.1	345.7		6	9		487.7	302.4	
5	24		555.4	344.6		6	10		486.46	301.65	
5	25		553.7	343.6		6	11		485.1	300.8	
5	26		552.0	342.6		6	12		483.9	300.0	
5	27		550.3	341.5		6	13		482.4	299.2	
5	28		548.6	340.4		6	14		481.3	298.5	
5	29		546.9	339.3		6	15		480.0	297.7	
5	30		545.45	338.40		6	16		478.7	297.0	
5	31		543.7	337.2		6	17		477.4	296.3	
5	32		542.1	336.1		6	18		476.1	295.5	
5	33		540.3	335.2		6	19		474.9	294.8	
5	34		538.7	334.3		6	20		473.93	294.03	
5	35		537.1	333.4		6	21		472.8	293.3	
5	36		535.5	332.5		6	22		470.9	292.5	
5	37		533.9	331.4		6	23		469.5	291.6	
5	38		532.3	330.4		6	24		468.5	291.0	
5	39		530.8	329.5		6	25		467.2	290.2	
5	40		529.10	328.25		6	26		466.1	289.5	
5	41		527.6	327.5		6	27		464.8	288.7	
5	42		526.1	326.6		6	28		463.5	287.9	
5	43		524.8	325.7		6	29		462.2	287.1	
5	44		523.2	324.8		6	30		461.54	286.34	
5	45		521.7	323.8		6	31		460.3	285.5	



THE THREE MACHINES WHICH MAY BE FLYING IN THE 1931 SCHNEIDER CONTEST: From left to right—S.1596, N.248 and S.1595. The central machine is the 1929 type modified, while the two outer are the new machines built this year. Standing in front of the machines are the members of the Schneider Team. (FLIGHT Photo.)



GETTING OVER THE "HUMP": *Flt. Lt. Stainforth taking off in S.1596. (FLIGHT Photo.)*

A large section of the British aviation community will watch the contest from the White Star Liner *Homeric*, which will be anchored as close as possible to the western turning point on Ryde Middle Shoal.

The most difficult part of the contest to get access to will be the area set aside for the preliminary trials. This lies to the west of the Schneider course, and upon the wind direction on the day of the contest will depend where in this area the machines will take off and alight. Cowes and Calshot are the two points ashore likely to be most favourably situated for watching the preliminary trials.

The various anchorages set aside for the purpose will

afford good views of the contest, and doubtless they will be crowded with vessels of all kinds and sizes, from the majestic ocean liner to the modest dinghy.

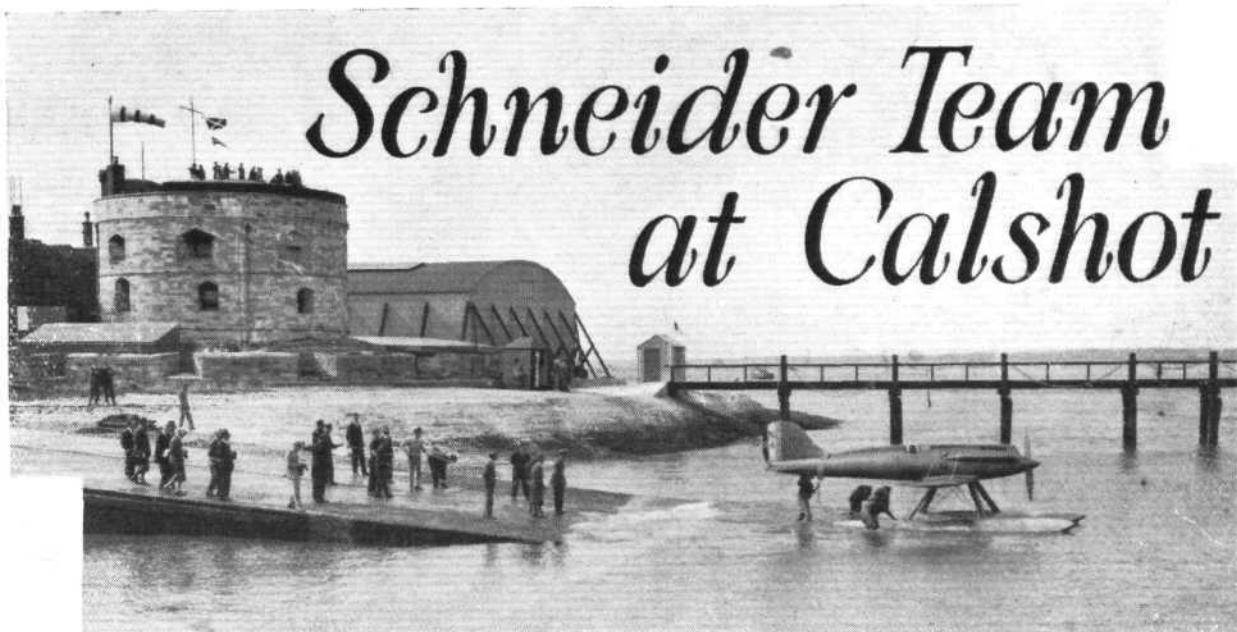
Postponement

In the case of unfavourable weather conditions on Saturday, September 12, the organisers may postpone the contest until Sunday, September 13, and again until Monday, September 14, and so forth until the weather is suitable. The Royal Aero Club has no authority, under the international regulations, to postpone the race other than from day to day, and then only on account of weather conditions.



READY FOR LAUNCHING: *S.1596 on one of the special pontoons used for transporting the machines from Calshot to the point of take-off. (FLIGHT Photo.)*





By MAJOR F. A. de V. ROBERTSON, V.D.

'A Bomb-shell

CALSHOT.—*Thursday, September 3.*—The course of Schneider training seldom runs smooth, and those who followed the training at Calshot two years ago remember well the alarms and excursions which kept us all on tenterhooks from day to day. But for sensation, surprise, despair and controversy, few days have ever surpassed to-day.

It was a wild morning, and obviously no flying was possible. Correspondents did not hurry down to Calshot. They made the best of the amenities offered by the hotels in the neighbourhood. From the dull lethargy which pervades a non-flying day they were roused by a sudden ringing of telephone bells. The Fiery Cross had gone round, and in a few moments all the correspondents were stamping on self-starters and speeding over the execrable roads in this part of the New Forest, heading for Calshot Spit.

There the astonishing news was learnt that both Italy and France have practically withdrawn from the contest. That morning Lt. Col. Bitossi, the Italian Air Attaché, had called upon Com. Perrin, Secretary of the Royal Aero Club, and shortly afterwards a similar call was made by Lt. Sala, the French Air Attaché. The latter was accompanied by M. Lioré, Vice-President of the Aero Club of France, who specially crossed over from Paris the night before. Both deputations made practically identical statements. They announced that unless a postponement of at least six months was granted it would be impossible for the Royal Aero Club of Italy and the Aero Club of France to send their teams to compete in the Schneider Trophy. The grounds given for this decision were, in each case, bad weather, bad luck, and loss of pilots and of aircraft. The two clubs added that they hoped that Great Britain would consider the postponement on account of the great efforts made by Italy and France to develop high-speed flying, and because it would not be satisfactory to Great Britain to win by a mere "walk over."

I heard that the French also made an appeal to Great Britain to act under Article 8 of the Regulations of the Contest, which reads as follows:—"The Trophy may be competed for every two years between April 1 and November 15. The Club holding the Trophy must fix, before January 31 of the year preceding that of the competition, a period of six weeks, in the course of which the contest must be held. The exact date shall be announced at least three months before the contest."

"If within the prescribed period no competitor makes a start, the Official Stewards shall decide whether the contest should be annulled or a further opportunity to start given."

It is for lawyers to interpret this article. On the face of it, it seems to mean that, while the Royal Aero Club has no power to grant a postponement, nevertheless a postponement might be arranged if the British pilots simply did not turn up to face the starter on any day

during the six weeks' period. I think, however, that if such action were taken (which is not in the least likely to happen) it would not be in accordance with the spirit of the regulations of the contest. Such action would smack of evading the regulations by trickery—taking advantage of the letter to break the spirit of the regulations.

I understand also (and this may or may not be very important) that the representatives of Italy and France were invited to put it down in writing that if the postponement were not granted their entries would definitely be cancelled, and that they both declined to do so.

The following is the text of the communiqué issued by the French Air Ministry on September 3:—

The French and Italian high-speed flights up to the last minute have neglected no effort in order to assure their participation in the Schneider Trophy contest. In spite of the eagerness of test pilots and those entrusted with the high-speed machines, engineers and constructors, to be ready for the race, bad accidents and exceptionally unfavourable weather conditions have made it impossible to bring the machines to the desired degree of perfection. In these conditions the French and Italian Ministers of Air, after consultation, have come to the common decision that due care for the safety of the pilots and the reputation of their countries' products do not permit them to enter machines which have been prevented by circumstances from being completely ready. General Balbo and M. Dumesnil express their unqualified admiration for the works accomplished by their respective pilots and technical experts, but consider it their duty to beg the Royal Aero Club of Italy and the Aero Club of France to request the Royal Aero Club of Britain to postpone this great international competition until next summer. Meanwhile they have both given orders that the research and experimental works now in progress should be continued without interruption.

In the afternoon there was a long consultation between the Air Ministry and the Royal Aero Club, at the close of which the club informed the Aero Clubs of Italy and France that under the regulations it had no power to grant a postponement of the contest. This answer, of course, is quite correct, and in accordance with the attitude adopted in similar circumstances in 1929.

The following is the text of the reply sent by the Royal Aero Club to the Aero Club of France:—

September 3, 1931.

SIR,—I have the honour to acknowledge receipt of your communication of even date through Monsieur Lioré with regard to the date of the Schneider Trophy Contest and the proposed non-participation of the British team this year.

The matter has been carefully and most sympathetically considered by the Schneider Committee to-day, and enclosed I beg to hand you copy of a letter, which has been addressed to the Royal Aero Club of Italy, in which it is pointed out that the International Rules, which govern the Contest, do not permit of any alteration in the date, other than such day-to-day postponements as may be considered necessary by the Stewards on account of adverse weather conditions.

Your suggestion that Great Britain should associate herself with your country and Italy in approaching the Fédération Aéronautique Internationale to agree to a cancellation of this contest and the holding of a new contest in 1932 (and there is no guarantee that the Fédération would agree to this procedure) would be equivalent to the Royal Aero Club proclaiming itself as not being ready to compete on September 12, which, in fact, is not the case.

Further, the Royal Aero Club gave its undertaking to hold the Contest between the dates August 4-September 19, 1931, and this undertaking was given at the request of the Fédération Aéronautique Internationale and at the instance of one of the challenging nations.



(FLIGHT Photo.)

In all the circumstances, therefore, my Committee have decided with regret that it is quite impossible to accede to your request.

Before coming to a decision, the Royal Aero Club were compelled also to take into consideration the fact that only nine days now remain before the appointed date, that the elaborate preparations necessitated by the conditions at present governing the Contest are virtually complete, and that a very large expenditure has in consequence already been incurred by all concerned, including the many local authorities and private interests who have undertaken the provision of accommodation for the general public.

I need hardly point out that the Royal Aero Club and the British public will be greatly disappointed if indeed the French team find themselves unable to compete in the Contest on September 12.

I have the honour, Sir, to remain,
Yours faithfully,

The Secretary,
Aéro Club de France,
6/8, rue Galilée,
Paris, France.

Secretary.

The following reply was sent to the Royal Aero Club of Italy:—

September 3, 1931.

SIR,—I have the honour to acknowledge receipt of your communication of even date through the Air Attaché to the Italian Embassy in London, in which you intimate that the participation of the Italian Team in the Schneider Trophy Contest depends upon a postponement of at least six months.

It is with great regret, however, that I am compelled to point out that the International Rules, which govern the Contest, do not permit of any alteration in the date other than such day-to-day postponements as may be considered necessary by the Stewards on account of adverse weather conditions.

Any such change as you suggest is, therefore, not a matter within our discretion, and we, unfortunately, have no option but to hold the Contest on the appointed date.

I need hardly point out that the Royal Aero Club and the British public will be greatly disappointed, if indeed, the Italian Team find themselves unable to compete in the Contest on September 12.

I have the honour, Sir, to remain,
Yours faithfully,

The Secretary,
Reale Aéro Club d'Italia,
Via Piacenza 6,
Rome, Italy.

Secretary.



OTHER OFFICERS OF THE HIGH-SPEED FLIGHT:
On the right FLT. Lt. E. J. L. Hope, A.F.C., and on the left FLT. Lt. W. F. Dry, Engineer Officer.

(FLIGHT Photo.)

In view of the refusal of the two challengers to make it definite in writing that the entries would be cancelled if the postponement were refused, I do not feel absolutely convinced that it is as yet certain that there will be a "fly over" by Great Britain. We shall know more to-morrow, which is the latest date on which the names of pilots must be given to the Royal Aero Club. If no Italian or French pilots are registered, then those two countries are definitely out of the contest. If, however, the names are given, the uncertainty will continue for a short time.

At Calshot, however, it was generally accepted that the French and Italians are not coming, and depression was profound. Up to this morning we had felt fairly certain that both teams would put in an appearance. Various pieces of circumstantial evidence had contributed to that belief. The intimations made by the Air Attachés to the Royal Aero Club came upon us like a bomb shell. It was said that even Sqd. Ldr. Orlebar was unable to conceal completely his feelings of disappointment and annoyance. By the afternoon, however, when the pilots came down to the Spit, he had regained his composure and was his own genial self again. Of course, the chief feeling at Calshot was sympathy with the disappointment of our pilots. In particular everyone's thoughts turned to Stainforth, that grand pilot who was disappointed in 1929, and whom many regarded as the probable winner of 1931. "George" is proverbially imperturbable. It is impossible to hustle him, and he never hustles, except when he is in the air. He brought Mrs. Stainforth down to tea in the N.A.A.F.I. tent in the afternoon and looked as unmoved as ever. Well, perhaps he will be proclaimed in due course the official winner of the last Schneider contest.

It is generally accepted that (weather permitting) our team will fly round the course on September 12, and will try to improve on the 328.63 m.p.h. of 1929, and also beat the world's record for 100 kilometres in a closed circuit which Atcherley put up to 331.7 m.p.h. I do not know if it has yet been decided whether one or two or three machines will be sent round the course. There would not seem much point in sending the S.6 "A" round unless it were to demonstrate the completeness of our arrangements. An interval of three-quarters of an hour is allowed between the starts of the British machines. One suggestion is that Stainforth will be sent off first in a S.6 "B" flying at maximum engine revs., and that if he satisfactorily breaks both records the matter may be allowed to rest there. The second S.6 "B" would be ready as a reserve if wanted. I might hazard a guess—it is only a guess—that Long will be the second pilot.

In the following week an attempt will be made on the three kilometre record. One pilot has already been timed over that course, but the time has been kept secret. Various people profess to have inside information of what the speed was, but all statements should be regarded with suspicion. Of course, it was to be expected that some optimists would declare it to be above 400 m.p.h., but others, but one whit less likely to know the facts, are equally convinced that it was under that figure.

One fact there can be no harm in mentioning at this date. The formidable feat of landing a machine with absolutely full load of petrol has been performed quite satisfactorily. It was done at a very early stage, I

believe by Stainforth, and no undue difficulty was experienced. Most of the onlookers were not aware of what they were seeing.

After the sympathy felt for our own pilots, next comes a general sympathy for the pilots of Italy and France. We do not know much about the French pilots, and we cannot understand why only the names of civilian pilots are mentioned by French correspondents. Can it be, it is asked, that the French seaplanes are so dangerous to fly that the head of the Naval Air Service has forbidden his officers to have anything to do with them? But we know the Royal Italian Air Force. They are sportsmen in the best sense of the word. Their disappointment must be as keen as that of Orlebar and his men, and we feel deeply for them. It is not they who have failed, but the whole organisation for producing racing seaplanes and engines by a given date.

A Victory for Design

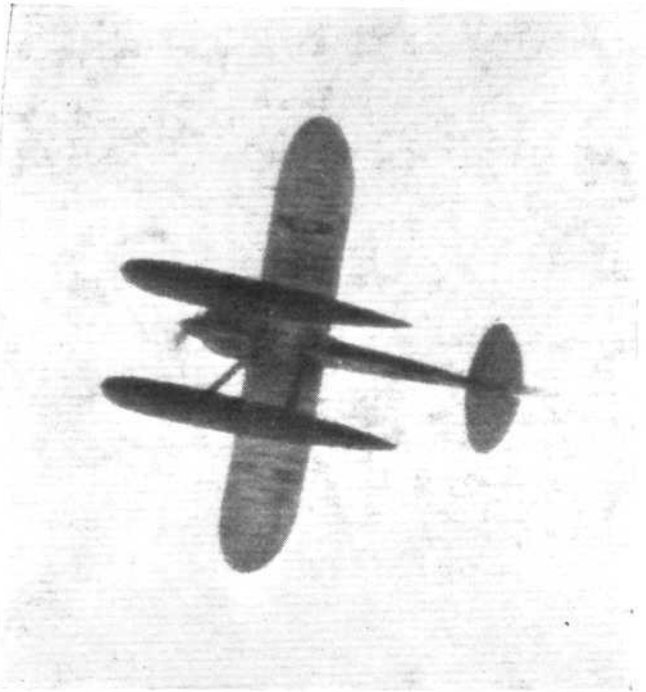
If it comes about that Great Britain wins the last Schneider contest by flying unchallenged round the course, it will be an outstanding victory for British design and organisation. The real victors will be Mr. Mitchell, the designer of the S.6, and Mr. Rowledge, the designer of the Rolls-Royce "R" engine—and all the other designers and workmen who have contributed to the production of the finished racers. In that case, we can boast that for three successive contests our machines and engines have been ready by the appointed date, and that our engines have lasted the course when those of our opponents have failed.

In 1927 at Venice two Napier engines finished the course, while all three Macchi-Fiat machines had to land. In 1929 two Rolls-Royce and one Napier finished the course, but only one Italian seaplane (and that an old and comparatively slow one) could do the like. And now in 1931 we have a team of three machines ready which we believe can hold the Trophy against all comers. We are told that no foreign machines can even be put into the air against us. Could any victory of design be more complete and overwhelming?

The Italian and French Pilots

Friday, September 4.—A further surprise awaited us at Calshot this morning. Last night both the French and Italian Aero Clubs sent in the lists of their pilots to the Royal Aero Club. These lists are given below. This action was naturally a puzzle to us. Were the challengers thinking better of their first stated determination? We knew from the experiences of two years ago that the sporting Italian pilots would be anxious to come if they had anything which they could even hope to make to fly, and doubtless the French pilots were of the same mind. Our hopes undoubtedly revived to a considerable degree, and bets were offered and taken by pessimists and optimists as to whether there would in the end be a real contest or not.

It was a wet and wild day, and Calshot looked a dismal place. So, in all probability did most places in England.

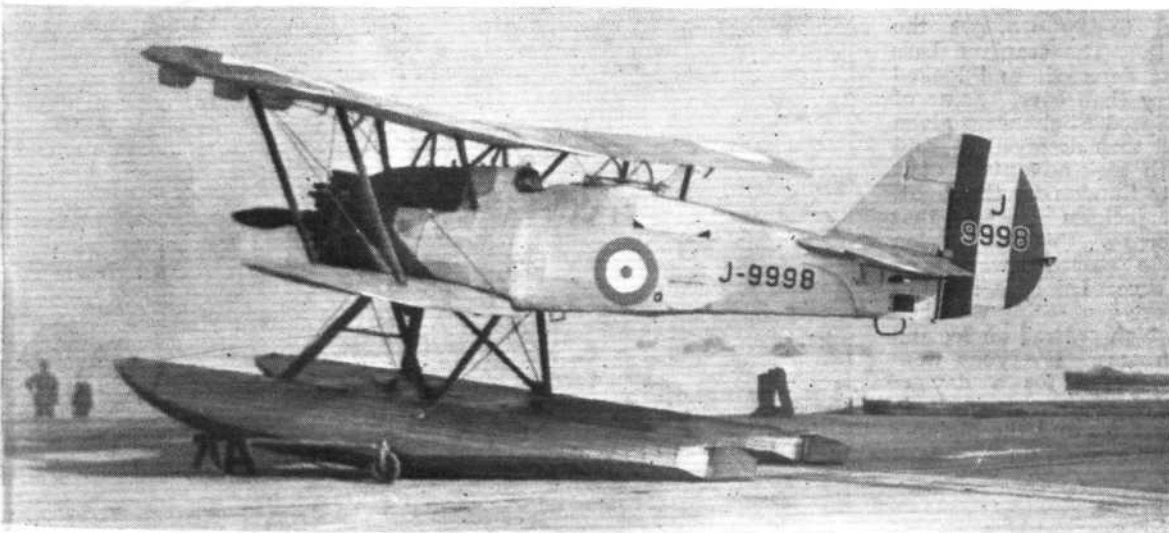


TRAINING: One of the Gloster-Napier VI monoplanes, which have been used extensively for practice flying by the Schneider Team. (FLIGHT Photo.)

No flying was possible, but we hung about and discussed matters because there was nothing else to do. As evening approached, and we were just thinking of departing in search of an evening meal, the Press Officers of the Air Ministry told us that an announcement was about to be made by the Ministry, and that we had better wait. About 7 p.m. it came through, and was to the effect that our Air Attachés at Rome and Paris had ascertained that the two foreign teams definitely would not come over. So that ended all our hopes. "Farewell Romance!" Nothing now remains but to fall back upon technical superiority, and show the world that we can produce seaplanes and engines by a given date which are the best of their kind in the world.

The following is the text of the Air Ministry announcement:—

"The Royal Aero Club has been informed by the Air Ministry that in response to inquiries made by the British Air Attachés in Paris and Rome, official notification has now been received from the French and Italian Air Ministries that France and Italy will not be competing in the forthcoming contest for the Schneider Trophy to be held on September 12. Arrangements already made will be unaltered. The British team will carry out its programme as arranged, and will endeavour to beat the world's speed record for 100 km. set up in 1929 and put up a better speed over the whole course."



THE BUS OF ALL JOBS: An Armstrong-Whitworth "Atlas" ("Jaguar") seaplane used by the High-speed Flight at Calshot. (FLIGHT Photo.)



OFF TO THE SCENE OF OPERATIONS: Squadron Leader Orlebar, Flight Lieutenant Castaldini, and Mr. W. Lappin going off in a "Sea Car" to watch flying practice. (FLIGHT Photo.)

The following are the names of the Italian and French pilots who were entered by their respective Aero Clubs:—

THE ITALIAN TEAM

Maggiore (Major) Guglielmo Cassinelli ;
Tenente (Lieutenant) Pietro Scapinelli ;
Tenente Stanislao Bellini ;
Tenente Ariosto Neri ;
Maresciallo (Warrant Officer) Francesco Agello.

THE FRENCH TEAM

1. Capt. (of Reserve) Sadi Lecointe ;
2. Sub.-Lt. (of Reserve) Assolant ;
3. Capt. Vernhol.

SUBSTITUTES

1. Lt. Retourna ;
2. Flt. Sgt. Baillet ;
3. Flt. Sgt. Dumas.

Bad Weather

Saturday, September 5.—Capt. Jackson had told me that this would be a real bad day, and so it was. A very large depression was slowly crossing the British Isles, and to-day we got the worst of it. The seaplane base was almost deserted, and looked more dreary than ever. Some of the High-Speed Flight were given leave—well they deserved it—and F/O Snaith took advantage of it to go up to London for the night. But Capt. Jackson also said that by to-morrow this depression would have passed away, and would be succeeded by a ridge of high pressure connecting the anti-cyclones which centred on Iceland and the Azores. Everyone went to bed prepared for a day of aerial activity after a week in which only S.5's and the biplanes had been able to go up.

Flying Again

Sunday, September 6.—The Press Officers are indefatigable people. At a very early hour Mr. Bowyer was on the telephone to all the hotels where air corre-

spondents were resting their weary heads, and hall porters were soon rousing them from their downy couches. When I arrived at Calshot, both the S.5 machines were out, and were being got ready. At 8.40 a.m., N.219 was launched, with Stainforth in the cockpit. By the way, both the S.5's now have direct-drive Napier engines in them. Stainforth is a master of his art, and for 15 minutes he flew about with his usual complete mastery of the machine. His landing was a model of how a racing seaplane ought to be put down on the water, a long glide with the heels of the floats well down until they just dipped into the water down to the step, and then the water took charge and bore the machine along.

Boothman was the next to go out, in N.220, the 1927 winner. The S.5's are now always launched from the slipways when the water permits, and are not towed out. By this time the water was very full of craft of all sorts, from steamers to small sailing yachts, and the wind was blowing directly up Southampton Water. Boothman had to hurry, and he hoiked up his machine after a run which must have been nearly a record for shortness. He found the air quite bumpy, and farther out the water was too rough to make thoughts of an engine failure at all comfortable.

After 12 minutes he landed again, and then everyone went off to breakfast.

When we reassembled at Calshot after breakfast, Long was up in the "Fleetwing," examining the water. He flew over the castle and dived twice. This was the signal to say that the water was suitable for S.6 seaplanes to fly. The one "A" machine, N.248 (holder of the 100-km. record), was ready on a pontoon, while one of the "B" machines, S.1595, had already been towed out on a pontoon to near Lee-on-Solent. Experiments were being tried with different propellers on S.1595, and though the machine was at least four miles away, it was decided to have her back and change her prop. The other propeller was placed ready on the slipway, and when "95" got back the change was made in about 20 minutes.

The order of flying was:—First, Long in the "A," N.248 ; then Stainforth in S.1596 ; and, third, Snaith in S.1595, with the new prop. Snaith was expected back by



CHANGING A PROP: As in previous years, the Fairey Aviation Company has supplied all the metal airscrews for the Schneider machines. (FLIGHT Photo.)

about noon, and a car was sent into Southampton to meet him. His flight was to be in the afternoon.

The seaplanes N.248 and S.1596 were then taken out on pontoons to the neighbourhood of Lee, Orlebar going out as usual in the sea-car. This was the first flight of N.248 since her return from Woolston after repairs, necessitated by Hope's accident. Hitherto it has been an invariable practice for Orlebar to make the first flight in any machine which had just come from the works, but on this occasion he allowed Long to take the "A" up without testing her himself. No doubt he realised how bad weather had kept everyone short of flying practice; but at the same time this incident showed the confidence which the captain has come to feel in his team, of which Long is one of the most trusted members.

Though the "A" type has larger floats than it had two years ago, it has still less floating surface and keel surface than the "B" type. It is consequently less easy to handle on the water. The new "B" type floats are simply enormous, and, to my mind, they make the machine look more shapely and better proportioned. Long took off at 12.15 p.m., and had to correct a tendency to porpoise in N.248, which he did quite successfully. His run was roughly 27 seconds. In the air he put his machine through a variety of turns at various angles and with varying amounts of throttle. The team is working very scientifically on the problem of the best compromise between the gradual turn and the sharp "flick" banking turn. Probably every flight adds a little more to their knowledge. It is noticeable now that even in very sudden vertical banks the pilots seem to find no difficulty in preventing their machines from climbing. Long put the "A" through her paces for 15 minutes, which is the normal duration of a practice flight.

A Fine Flight by Stainforth

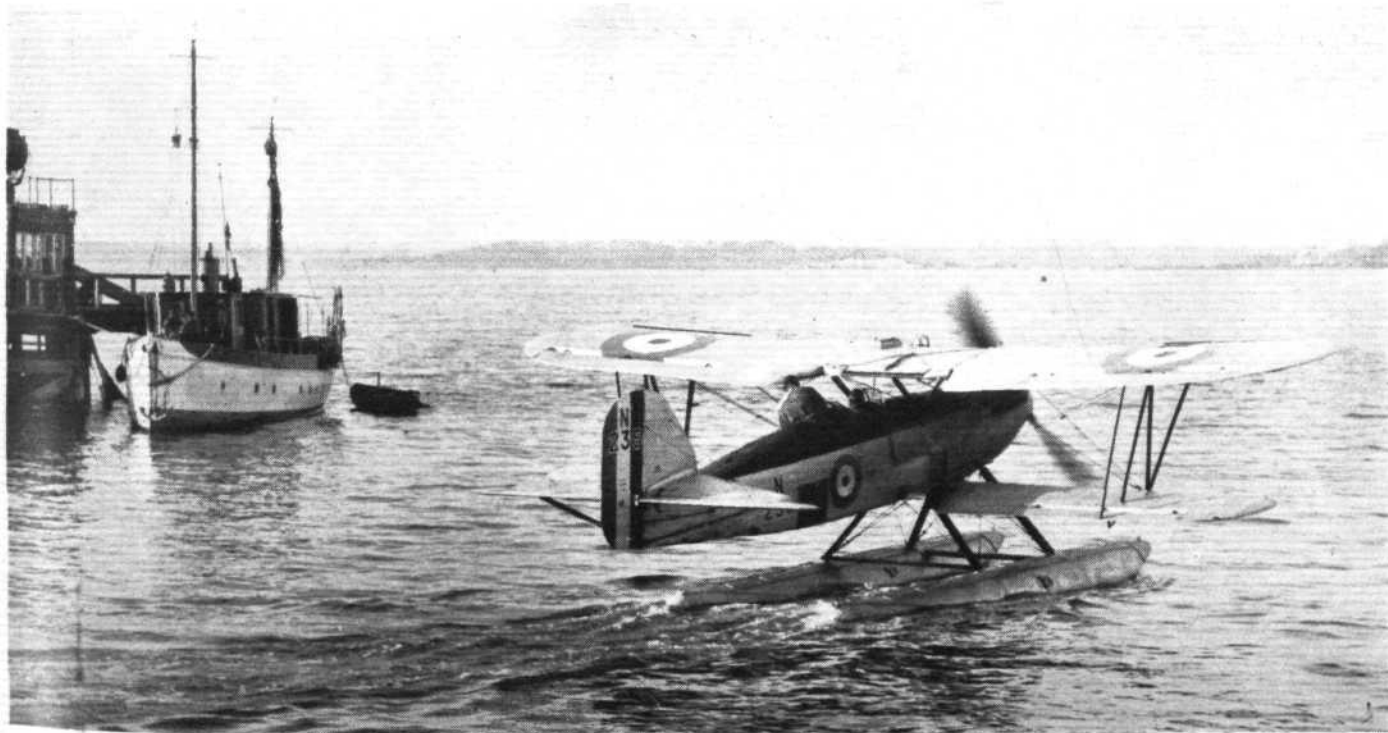
At 12.50, George Stainforth took up the "B," S.1596, and made the most masterly flight which it has been my fortune to witness this year. It was evidently a "research" flight, testing the effect of turns and banks of different degrees at different speeds, much in the way Long had done for the "A." It was extraordinarily interesting to watch, and to speculate as to what "George" would do each time he approached Calshot Castle. A battery of binoculars followed his every movement, watching critically to spot any abnormality in each of his circles. Each one, however, seemed to be a per-

fect example of how that particular turn should be made, and each one was different in character from all the others. One almost complete circle was most sensational, so tightly was the S.6 held into its bank and turn. It recalled a fighter showing off some aerobatics. Stainforth, who was making his second flight of the day, stayed in the air a full 20 minutes, which is longer than the usual period. From the look of the flight, it seemed that the pilot had nothing more to learn, but in all probability the whole High Speed Flight will benefit by the notes which he produced at the end.

Stern duty recalled me to London before I was able to see the afternoon's flying, but as I ran into some heavy rain showers as I came, I fear that Calshot, too, did not have too good an afternoon. From what I have seen, I am sure that the country can feel the utmost confidence in its High Speed pilots and machines. They will have no opponents next Saturday, but I feel sure that they will put up a perfectly magnificent show of flying. May I be there to see!

A Press Canard

Before concluding, I must say a word about an incorrect rumour which very unfortunately crept into some newspapers. The Air Ministry issued Press passes to Calshot on condition (among other things) "of refraining from publishing (a) the precise speed which it is hoped the aircraft will attain, and (b) the actual speed which they accomplish on test." One test flight was timed, but the figures were naturally kept secret. Nevertheless, some correspondents who are not very familiar with flying matters somehow or other heard mention of the figure 405. As a matter of fact, this figure had reference to the flow of air through the supercharger, but it was erroneously supposed to refer to the miles per hour of the machine. Several newspapers published the statement that the test flight had achieved a speed of 405 m.p.h. Not only was the statement a breach of the conditions on which the passes were issued, but it was a statement for which there was no foundation. It has raised expectations which may be disappointed. If, when the flights are made over the three-kilometre course, the average speed is less than 400 m.p.h., the public may regard it as an anti-climax, and foreign nations may think that Great Britain has vaunted herself unduly, and that her pride has gone before a fall. The whole incident was extremely unfortunate and regrettable.



TESTING CONDITIONS: Squadron Leader Orlebar going out in a Fairey "Fleetwing" to see if the weather is suitable for the Schneider machines. With him is Mr. W. Lappin of the Rolls-Royce Company. (FLIGHT Photo.)

SCHNEIDER ITEMS

"Fly-over" by one Machine?

On September 8 the Air Ministry issued the following statement: "In the absence of both the French and Italian Teams from the Schneider Trophy Contest, the following is the procedure which it is intended that the British Team shall adopt: 'One of the two S.6 B Vickers Supermarine Rolls-Royce seaplanes which have been specially developed for the contest will fly the course and attempt to beat the 100-kilometre world's speed record, as also the record for the Schneider Trophy Contest. If this is unsuccessful, an attempt will be made by the S.6 A, which flew in the 1929 contest, followed by the second S.6 B.' "

Consumption and Propeller Tests

On Monday afternoon, September 7, F/O. Snaith took up S.1596. A different type of propeller has been fitted to it, and the object of the flight was a test of fuel consumption. After a flight of only about seven minutes, the pilot landed in the neighbourhood of Ryde, and was towed in. It was stated that the propeller was executing normal revolutions. Later on Snaith went up again in an S.5, and Long was in the air at the same time in S.1595. The latter had had its racing engine installed, and this was just a test flight. The machine will not be flown again until Saturday.

The 3-Kilometre Engine

It is understood that a special engine is being prepared by Messrs. Rolls-Royce, Ltd., with which to make the attack on the world's record speed over the 3-kilometre course. It is expected that this attempt will be made not earlier than Tuesday, September 15.

An Offer by Lady Houston

LADY HOUSTON stated on September 3:—To show that I am not downhearted if our airmen win by default and a walk-over, I challenge the airmen of the whole world to another race to be called the Houston Trophy, and besides giving the trophy I will award the winner £1,000 in money.

Don't go to Tangmere

The Air Ministry announces that the Royal Air Force aerodrome at Tangmere, near Chichester, Sussex, will not be available for use by civil aircraft on Saturday, September 12, the day of the Schneider Trophy Contest, or, in the event of the postponement of the contest, on the date on which it is subsequently held.

"Finishing"

THE finish of such aircraft as those prepared for the Schneider Contest plays a very great part in increasing their efficiency. This year a new departure is the use of a super-grade enamel for the final finish of the fuselage, wings and floats, as opposed to a cellulose finish, such as has been used in previous years. John Hall & Sons, Ltd., Bristol, have supplied this enamel, and the texture obtained with it has provided a surface such as should reduce skin-friction very considerably. Those units which are fabric covered, that is the ailerons and rudder, must, of course, be doped with cellulose, and the dope used is that supplied by Cellon, Ltd., of Kingston.

Dodging the Traffic

On Tuesday, September 8, Flt. Lt. Long took up the "B" seaplane S.1595, and did a consumption test, flying round one lap of the course. As he was about to land a small sailing boat got in his way. The position looked critical, for Long was gliding in low down and gradually losing flying speed. With great skill and presence of mind, he hopped his machine over the top of the masts, and then made a safe landing. On the same day, Snaith, in the "A," N.248, was unable to take off on account of the crowd of yachts and other craft, which made the water traffic almost as difficult as that of Oxford Street.

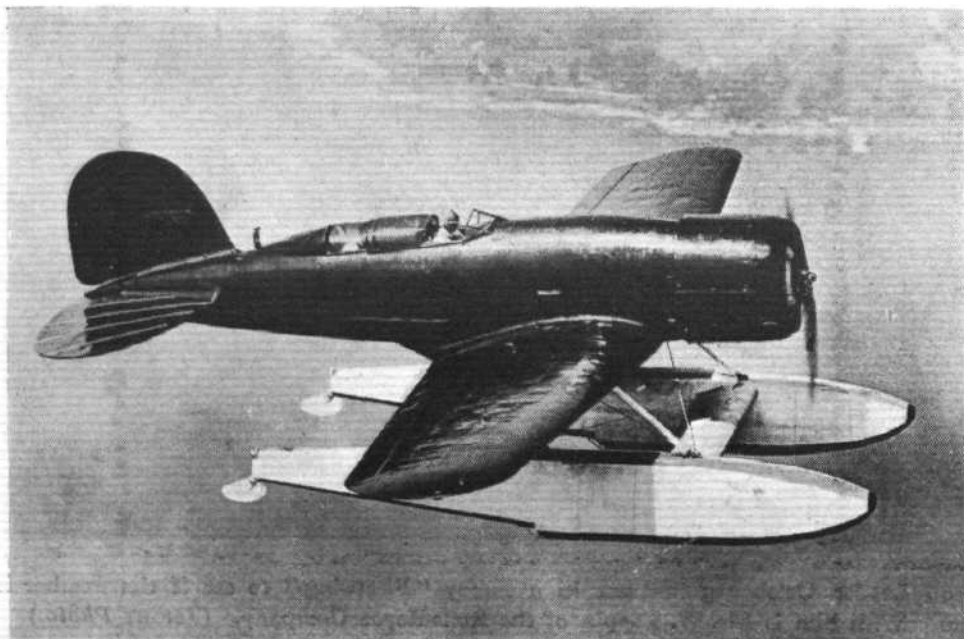
There was some excitement at Calshot when the fire alarm sounded, and it was found that fire had broken out in a yacht which was moored off Calshot. No one was hurt, but considerable damage was done before the fire was put out.

The welcome advent of anticyclonic weather has at length given plenty of chances for flying at Calshot.

As we go to press there is no definite knowledge of the order in which our pilots will be picked, but the opinion is general that Stainforth will be the first, and probably Long the second.

An Italian Flying Visitor

THE Italian pilot Meleri—who won second place in the Circuit of Italy—is flying from Italy to Portsmouth in the Breda 33 low wing monoplane, which obtained first place in the above competition, with one of the Directors of the Breda Co., in order to witness the Schneider Contest. Incidentally, it may be mentioned that after the contest, the Breda machine will be flown to various aerodromes in England in order that any who may be interested in the "Circuit winner" can make a thorough inspection.



FAST TOURING: A fine flying view of the Lockheed "Sirius" seaplane in which Col. and Mrs. Lindbergh are touring the world. This machine has extra tanks giving it a very large range, is very completely equipped with flying instruments and wireless transmission and receiving installations. The speed of this "Sirius" has made it possible for Col. Lindbergh to make the trip from New York to Tokio via Alaska and the Behring Sea in a total flying time of 84 hr. 5 min.

MORE SPEED

THE NORTHROP ALPHA is a fine type of the American modern transport aircraft. With a high performance and metal covering it is an attractive proposition to the operator to whom high speed, high payload, and low maintenance costs are of paramount importance.

It is now being used by National Air Transport, Inc., of Chicago, Illinois, to replace their obsolescent Falcon, Douglas and Boeing aircraft



THE Northrop Alpha is one of the fastest transport planes at present in service in the United States of America and is the second in our series of fast machines approximating to the specification for a mail-carrying machine which was recently called for by the Air Ministry.

In its standard form, it is a low-wing, all-metal, six-passenger cabin monoplane, and has a quick take-off, high cruising and top speeds, and an exceptionally good climb.

The whole fuselage and wing are of what practically amounts to monocoque construction, and, being all metal,

The clean lines of the Alpha show well in this three-quarter front view.

are exceptionally strong and require very little upkeep service.

Particular care has been taken to see that all controls, both flying and power plant, are readily accessible for inspection, and the engine mounting provides exceptional facilities for examination of all parts of the power-plant installation.

The wing is a new type of flat-plate multi-cellular structure, and recent tests by the U.S.A. Army Air Corps at

PERFORMANCE

All performance data obtained from flight tests (airscrew setting the same during all tests).

With Full Load

High speed	170 m.p.h. (273,6 km./hr.)
Stalling speed	60 m.p.h. (96,6 km./hr.)
Cruising at sea level at 1,800 r.p.m.	145 m.p.h. (233,4 km./hr.)
Climb at sea level	1,400 ft./min. (7,1 m./sec.)
Climb at 10,000 ft. (3,048 m.)	650 ft./min. (3,4 m./sec.)
Climb to 10,000 ft. (3,048 m.)	10,5 min.
Take-off run time	11,5 sec.
Length of take-off run	535 ft. (165,2 m.)
Run on landing with brakes	475 ft. (144,8 m.)
Absolute ceiling	21,100 ft. (6,431,3 m.)
Service ceiling	19,300 ft. (5,882,6 m.)

Seaplane Performance

High speed	165 m.p.h. (265,6 km./hr.)
Cruising speed	140 m.p.h. (225,3 km./hr.)
Climb at sea level	1,250 ft./min. (6,3 m./sec.)
Climb at 10,000 ft. (3,048 m.)	550 ft./min. (2,7 m./sec.)
Service ceiling	18,000 ft. (5,486,4 m.)
Absolute ceiling	20,000 ft. (6,096,0 m.)
Take-off time	15 sec.

General Data—Both Types

Power plant	P. & W. Wasp, 420 h.p.
Seating capacity	7 (including pilot)

U.S. Government Certification—Complies with Department of Commerce regulations for landplanes or seaplanes.

Landplane Specifications

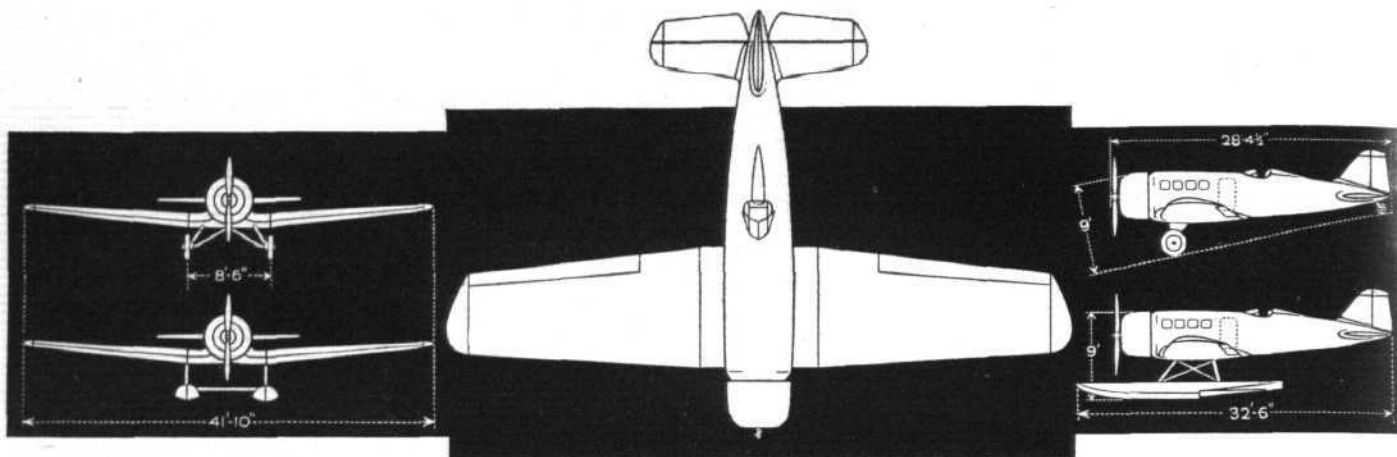
Power plant	Pratt & Whitney 420-h.p. "Wasp"
Weight fully loaded	4,500 lb. (2,041,2 kg.)
Weight empty	2,660 lb. (1,206,5 kg.)
Wing loading	15.25 lb./sq. ft. (74,5 kg./sq. m.)
Power loading	10.7 lb./h.p. (4,9 kg./h.p.)
Maximum fuel capacity	116 gal. (527,9 l.)
Maximum oil capacity	13 gal. (59,1 l.)

Seaplane Specifications

Gross weight	4,700 lb. (2,131,9 m.)
Length	32 ft. 6 in. (9,9 m.)
Weight empty	2,900 lb. (1,315,4 m.)
Wing loading	15.9 lb./sq. ft. (77,6 kg./sq. m.)
Power loading	11.2 lb./h.p. (5,1 kg./h.p.)

Dimensions

Span	41 ft. 10 in. (12,7 m.)
Length (overall)	28 ft. 4½ in. (8,6 m.)
Height	9 ft. (2,7 m.)
Tread	8 ft. 6½ in. (2,6 m.)
Chord, at root	8 ft. 4 in. (2,5 m.)
Chord, at tip	5 ft. 6 in. (1,7 m.)
Dihedral angle	3½ deg.
Area, wing (including aileron)	295 sq. ft. (27,4 sq. m.)
" ailerons	20 sq. ft. (1,8 sq. m.)
" fin	8.4 sq. ft. (0,8 sq. m.)
" rudder	7.9 sq. ft. (0,7 sq. m.)
" stabiliser	27 sq. ft. (2,5 sq. m.)
" elevators	19.7 sq. ft. (1,8 sq. m.)
Capacity of cabin	120 cub. ft. (11,1 sq. m.)
Aspect ratio	5.9 : 1
Price	21,500 dol. ex factory.



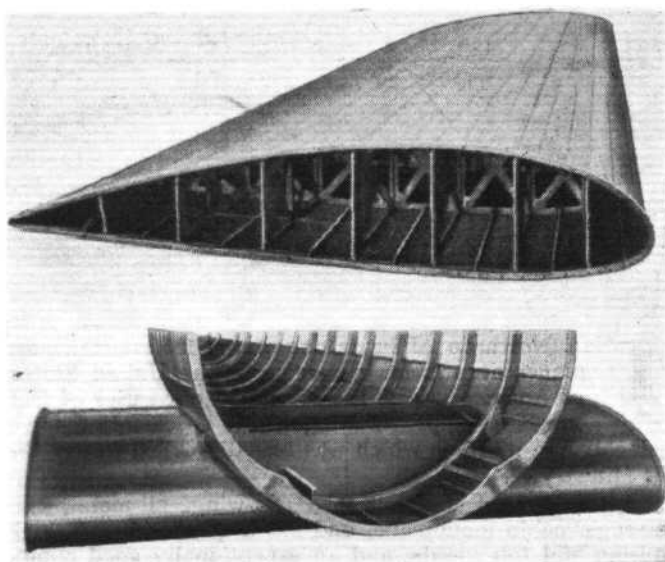
General arrangement drawings of the Northrop Alpha as a land and seaplane.

Daytona, Ohio, proved that its torsional rigidity was superior to any they had previously tested.

The Alclad skin of the monocoque fuselage has integrally-formed longitudinal stiffeners, which, together with ring-shaped bulkheads of channel cross-section, make it exceptionally rigid.

The N.A.C.A. cowl over the engine not only provides adequate cooling but also ensures an even air flow over the fuselage, resulting in exceptional low drag. The pilot's cockpit is at the rear of the passenger cabin, giving an excellent all-round view, while the cabin itself provides some 120 cub. ft. of space for the six passengers. The area between the fireproof bulkhead and the front seat, and between the pilot's cockpit and the rear seat, are available for luggage.

The controls have all been arranged so that they are effective down to, and even to a certain extent below, the stalling speed, and, being mounted on ball bearings, are light, and the Alpha is therefore exceptionally easy and not tiring to fly. Mr. John K. Northrop, of the Northrop Aircraft Corp., Burbank, California, which is a division of the United Aircraft and Transport Corp., was an engineer with the Douglas Aircraft Co. and later one of the founders of the Lockheed Aircraft Co. and is the originator of the Lockheed Vega and Air Express designs.



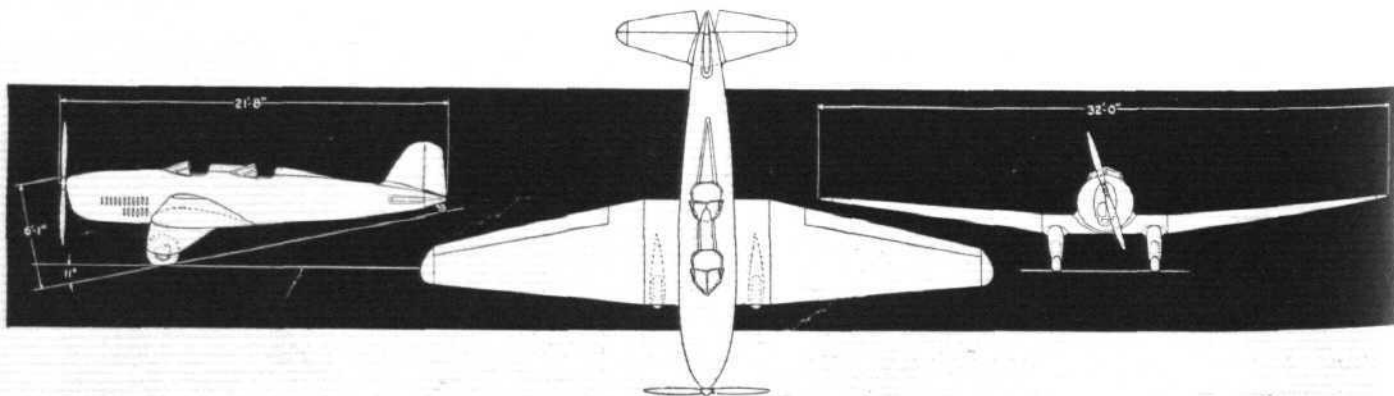
Above can be seen the flat plate multicellular type of wing construction and manner in which the Alclad skin is built up over ring-shaped bulkheads in the fuselage.

THE NORTHROP BETA is an open two-seater aircraft on same lines as the larger Alpha and for its size has an equally imposing performance.

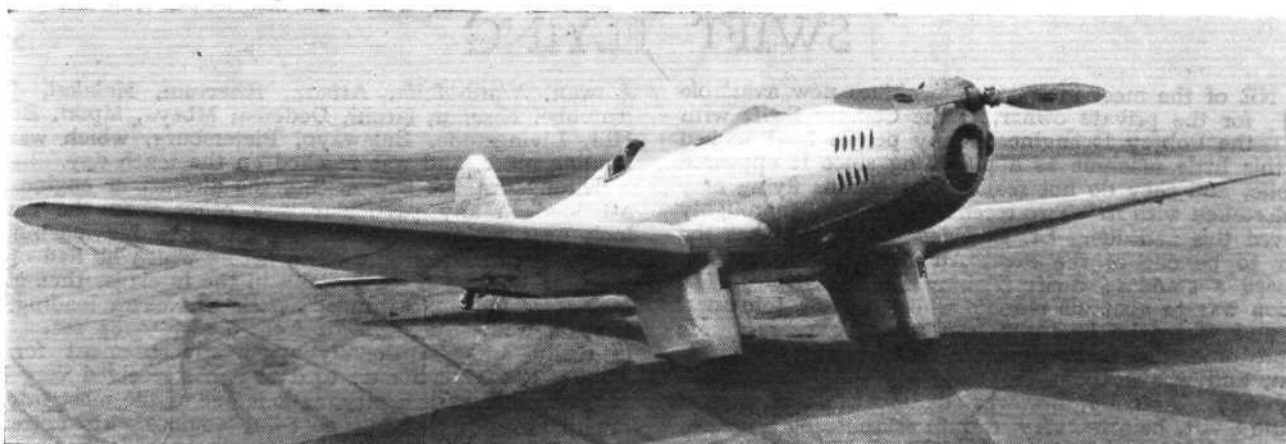
Its construction is in every way similar, and it should have great appeal to the private owner who prefers an open aircraft to a cabin one.

THE Northrop Beta embodies the same Alclad skin construction as has been used in the Alpha and is a small two-seater open cockpit machine. The landing gear is of the full cantilever type

of construction, while the usual spats are brought up to the wing and are of such a rigid nature as to make the use of cross bracing unnecessary. The total drag is thus kept low, which gives the Beta a high performance.



General arrangement drawings of the Northrop Beta; it should be noted that this is to a larger scale than the drawings of the Alpha.



The well streamlined and clean undercarriage of the Beta is particularly noticeable in this view.

PERFORMANCE (CALCULATED) WITH FULL LOAD

High speed	175 m.p.h. (281,6 km./hr.)
Stalling speed	48 m.p.h. (77,2 km./hr.)
Cruising at sea level at 1,750 r.p.m.	145 m.p.h. (233,4 km./hr.)
Climb at sea level	1,150 ft./min. (5,8 m./sec.)
Climb at 10,000 ft. (3,048 m.)	645 ft./min. (3,3 m./sec.)
Climb to 10,000 ft. (3,048 m.)	12.5 min.
Take-off time	10 sec.
Take-off run	500 ft. (152,4 m.)
Absolute ceiling	25,200 ft. (7,781 m.)
Service ceiling	22,700 ft. (6,918,9 m.)

Distribution of Load for a Flying Range of about 560 Miles

Weight empty	1,135 lb. (515,8 kg.)
Fuel for 4 hr. (30 gall.)	180 lb. (81,6 kg.)
(136,4 l.)	30 lb. (13,6 kg.)
Oil (4 gall.) (18,2 l.)	170 lb. (77,1 kg.)
Pilot	255 lb. (115,7 kg.)
Pay load	635 lb. (288 kg.)
Useful load, total	1,770 lb. (802,7 kg.)
Gross weight	

Specifications

Power plant	Menasco Buccaneer 160 h.p.
Weight fully loaded	1,770 lb. (802,7 kg.)
Weight empty	1,135 lb. (515,8 kg.)
Wing loading	12.9 lb./sq. ft. (63 kg./sq. m.)
Power loading	11.1 lb./h.p. (5,4 kg./h.p.)
Maximum fuel capacity	30 gal. (136,4 l.)
Maximum oil capacity	4 gall. (18,2 l.)

Dimensions

Span	32 ft. (9,7 m.)
Length (overall)	21 ft. 8 in. (6,6 m.)
Height	6 ft. 1 in. (1,8 m.)
Tread	5 ft. 6 in. (1,7 m.)
Chord, at root	5 ft. 10 in. (1,8 m.)
Chord, at tip	2 ft. 1 1/2 in. (6,3 m.)
Dihedral angle	4 deg.
Area, wing (including aileron)	137 sq. ft. (12,7 sq. m.)
Area, ailerons	13 sq. ft. (1,2 sq. m.)
Area, fin	4.4 sq. ft. (4,1 sq. m.)
Area, rudder	3.1 sq. ft. (2,9 sq. m.)
Area, stabiliser	11 sq. ft. (1 sq. m.)
Area, elevators	7 sq. ft. (0,6 sq. m.)
Aspect ratio	7.44 : 1
Price	8,500 dol. ex factory

BOOK REVIEWS

"THIS MOTORING"

THE 20th anniversary of the Automobile Association has been marked by the issue of an extremely well-written book, called "This Motoring." Mr. Stenson Cooke, Secretary of the A.A., is the author, and the book is in particular a record of some of his early difficulties. It is very readable, and when one thinks that in the past 25 years Mr. Stenson Cooke has built up the A.A. from the beginning to the world's largest motoring organisation, with a membership of 440,000, one cannot but help realise the stupendousness of the undertaking and see the justification for his writing a book about it.

"This Motoring," by Stenson Cooke (Cassell & Co.) Obtainable from FLIGHT Office. Price 4s. post free.

A NEW EDITION OF THE MOTOR MANUAL

THE *Motor Manual*, which is published by the Temple Press, is a standard handbook on all that appertains to the functioning of motor cars. This new edition, the 28th, has been enlarged, and includes such up-to-date features as a description of the main points of the new Traffic Act in so far as it affects the motorist's legal position.

The technical parts are also modernised and give details of such things as the fluid flywheel, free-wheel and upkeep of cellulosed car bodies. No one with a car can really afford to be without this motorists' "Vade Mecum."

"The Motor Manual" (Temple Press, Ltd.). Obtainable from FLIGHT Office. Price 2s. 10d. post free.



MOTHS IN CHINA: A dozen Gipsy Moths recently erected, tested and demonstrated at Mukden Aerodrome by Capt. Swoffer of Arnhold & Co., Ltd., De Havilland agents in China. Arnholds have supplied nearly 100 Moths to China in three years.

SWIFT FLYING

ONE of the most interesting machines now available for the private owner, is the Comper Swift with the Pobjoy R engine. Many people have looked upon this little machine as a plaything since it appeared in public, and they do not realise that serious flying may be undertaken with it. Two recent flights have thoroughly disproved this attitude. Lt. C. Byas, R.N., who has the honour to be one of the Fleet Air Arm pilots, recently purchased a standard Swift (Pobjoy R) G-ABNH. His intention was to visit his parents who live near Johannesburg, and whom he had not seen for nine years. He therefore proceeded to fly out in a comparatively leisurely fashion, and was not out to create a record on the trip in any way. Actually, however, due to the efficiency of the little Swift, he came very near to establishing a record, as his actual flying time from Heston to Johannesburg was only 73 hr., which as the distance was 7,320 miles gives him an average speed of over 100 m.p.h. It is trips such as these which show what may be done on a standard aircraft like the Swift, and how economical such a trip may be. For instance, his petrol consumption only worked out at 4½ gallons per hour.

The route he took from Heston lay through Cologne, Nuremberg, and Vienna, which he reached on the first day, then on via Beograd, Sofia, Constantinople for the second day's journey, to Ramelah via Konia and Aleppo for the third day; thence his route lay from Cairo, Assiut,

Asswan, Wadi-Halfa, Atbara, Khartum, Malakal, Juba, Entebbe, Kisumu, Moshi, Dodoma, Mbeya, Mpiki, Broken Hill, Livingstone, Bulawayo, Pietersburg, which was his landing place, and was reached on the tenth day.

Throughout the trip neither the aircraft or engine were attended in any particular way other than the cursory look over which every good pilot gives his machine on such a flight. The only extra fitting which he had on the machine was a ten gallon tank in the fuselage, thus giving him some 600 miles range. With this extra loading, the take-off was only increased from 5 sec. to 5½ sec. This is really an exceptionally good advertisement for the Pobjoy R engine, for up to date it has received very little publicity, which is a pity, as it is one of the most interesting and original of our post-war engines. Its extremely low weight together with high h.p. have made many people think that it cannot possibly stand up to hard work, more especially as Mr. Pobjoy pinned his faith to high revolutions and relied upon a simple form of gearing to keep the airscrew speed down to an efficient ratio. The new R type, however, has gone through all tests in an exemplary manner. It passed its type test at the first attempt without any trouble whatever, and since then has also succeeded in maintaining this record by getting round both the King's Cup race, the Grosvenor Cup race, Lt. Byas's flight to Johannesburg, and Flt. Lt. Nick Comper's flight to Italy and back. Flt. Lt. Comper is, of course, the designer of the aircraft, and this flight of his to Italy, which covered a route from England through France to that country and back, again still further enhances the already favourable opinion which has been growing up of both the Swift and Pobjoy engine. The total flying time for his actual trip of 2,600 miles was 26 hr., which gives an easy cruising speed of 100 m.p.h., particularly creditable, when it is realised that a large part of the journey was made against somewhat severe head winds. The petrol bill on this occasion was only some £10, which shows what an economical little aircraft the Swift really is.

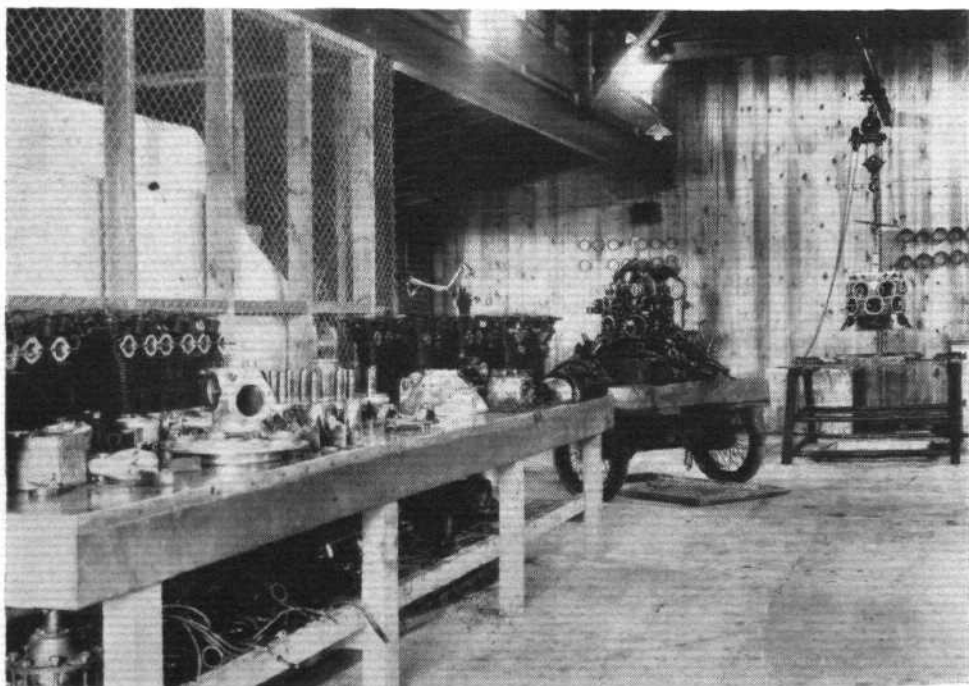


Lt. C. Byas, R.N., seated in his "Swift." The comfortable position which the cockpit allows the pilot should be noted.



THE ENGINE SHOP: Air Service Training, Ltd., overhaul their own engines at Hamble, and in this shop all pupils are given a thoroughly practical training of such work upon engines which are in actual use. They therefore have the benefit of doing the job properly and so gaining more experience than they would do if the engines were dummies. Armstrong Siddeley engines are standardised on the school, and pupils thereby get a very comprehensive knowledge of all sizes of these well-known air-cooled radial engines.

(FLIGHT Photo.)



Private Flying & Club News



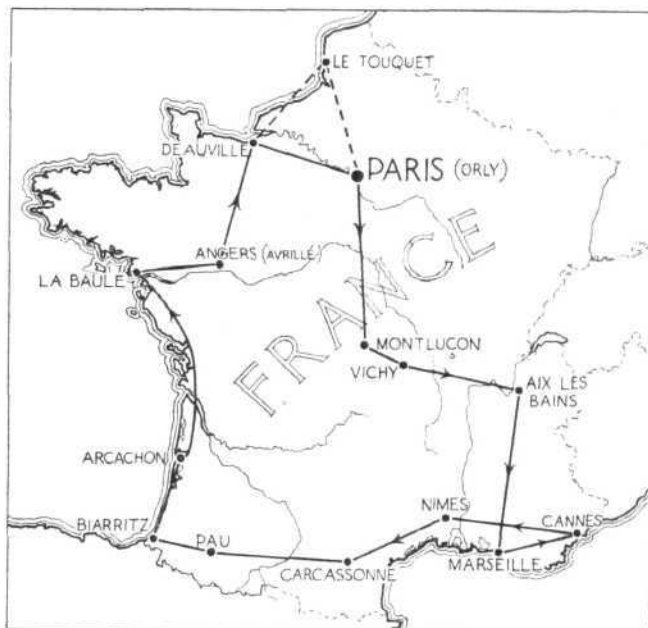
THE FINISH: Competitors ranged up in front of the Roland Garros Hangar at Orly.

DUNLOP CUP TOUR OF FRANCE

AFTER a Tour of some 2,900 kilometres (1,850 miles) around France, in competition for the Dunlop Cup, 21 of the 26 light tourist planes that had "taken off" from the Orly Airport eight days previously (as described in our last issue) returned to that aerodrome on Sunday afternoon, August 30 last.

All kinds of weather had been encountered. For the first two days, while flying over the sections Orly-Montlucon-Vichy-Lyons-Nîmes, the air tourists met with considerable rain and fog. Three planes were eliminated between Orly and Montlucon, on the first day of the Tour. The Farman 231 of Petit and the Potez 36 of Fougere damaged their airscrews, and the Potez 36 of Marzin its landing gear in making forced landings owing to the bad weather. On the second day Letartre, piloting a Farman 202, was caught in a squall and obliged to come down at Montelimar, and lost considerable time. He rejoined the Tour at Nîmes, but did not make the landing at Lyons as required by the schedule, and was thus eliminated from the Contest. He continued to accompany the Tour, however, as a tourist. The bad weather of the first two days made it difficult for the pilots to maintain their required speeds, and a number of penalisations were incurred.

Sunshine and a moderate "tail wind" were encountered, for the first time, on the section leaving Nîmes on Wednes-



The route followed in the Dunlop Cup Tour of France.



THE WINNER: Count de Rouvre's Morane "Moth" ("Gipsy") on which he won the Dunlop Cup Tour of France. The Count (in plus "quatre") is handing over his log.

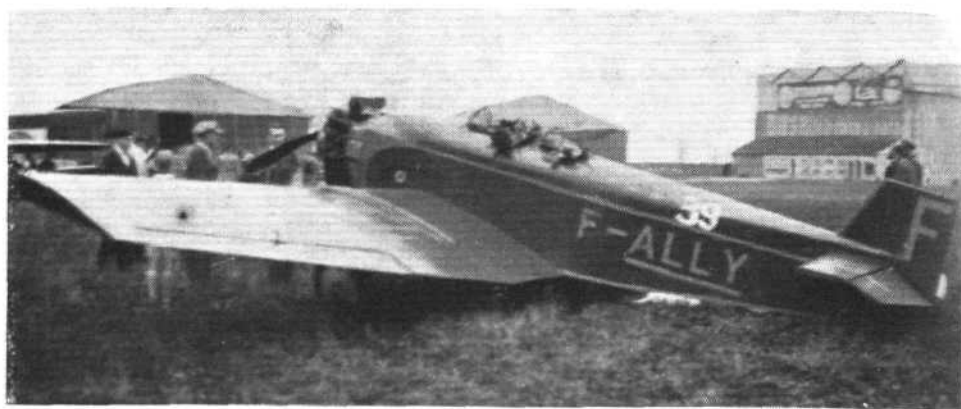
day morning, and lasted as far as Cannes, being much appreciated by the pilots. On making a difficult landing at the latter airport, Paul Louis Richard and de Marolles, who were flying a Morane "Moth," damaged their undercarriage, and were eliminated from the Tour. Twenty-one planes were thus left in the Contest, all of which continued on to the end of the Tour.

A strong "Mistral" (high wind from the neighbouring mountains) made the section Cannes-Carcassonne somewhat lively for the pilots, but all the planes arrived safely, although a number of penalisations were incurred. More or less bad weather continued to be again encountered from Carcassonne to the end of the Tour. Up

to Saturday, August 29, the Morane "Moth" of Hermann and Signerin had been leading. It had been making fast time and had escaped any penalizations. On taking off from Anger, however, the pilots found that one of their rocker arms was seizing, and they were obliged to return to the airport for its adjustment. They thus lost considerable time, which they were unable to regain, and finished sixth in the list.

Two sections, Deauville-le Touquet, le Touquet-Orly, were scheduled for the last day of the Tour, but, owing to the rain and fog prevailing on Sunday morning, the "take-off" from Deauville was postponed until 3.10 o'clock that afternoon, and the planes were then started directly for Orly, the flight to le Touquet being cancelled. A large crowd was waiting at the Home airport to see the finish of the Contest.

The Caudron biplane, "Luciole," piloted by Brevier, was the first to appear flying over the Orly aerodrome at 4.40 p.m. This machine was quickly followed by the Farman 234 of Arnoux and Brabant and the Farman 231 flown by Nouvel. The other planes also arrived in rapid succession, and within about half an hour all the com-



SECOND PLACE: The Farman 234 (95 h.p. Salmson) on which M. Arnoux obtained second place.

the Dunlop Co., with the approval and aid of the Aviation Authorities and Constructors, created this Dunlop Tour of France.

The proof had been given, Colonel Petavy declared, by the results shown on this Tour: 26 planes left Orly a week ago, and 23 returned (two machines accompanying the Tour as tourists). The pilots (with two exceptions) were not professionals, but amateurs who owned and flew their own planes and who continued on the Tour, notwithstanding the bad weather they had encountered for a large part of the time. The Colonel predicted in conclusion that hundreds of tourist planes would soon be flying over France, and warmly thanked the Committee of the Aero Club of France for the efficient work that it had performed.

As described in last week's number of FLIGHT, the contestants were required to maintain an average speed, over each section of the Tour, of 75 per cent. of the maximum speed, less 4, of their planes as shown on the trials for "homologation" (acceptance) before the Service Technique. As the Dunlop Tour was flown at a higher altitude than these preliminary trials were made, a deduction of 4 km./hr. was allowed from the maximum speed shown at these Service Technique tests.

If the contestant exceeded this figure, he received a one-point premium for each km./hr. he made above it, the maximum allowance being ten points for each section of the Tour. If, on the other hand, however, the contestant failed to maintain this cruising speed, he was penalised one point for each km./hr. that he flew below

THE DUNLOP CUP TOUR OF FRANCE. RESULTS.

Machine	Engine	Pilot and Passenger	Penalties	No. of Points
1. Morane "Moth"	Gipsy 85 h.p.	de Rouvre and Dary	Nil	117
2. Farman 234	Salmson 95 h.p.	Arnoux and Brabant	"	115
3. Farman 234	Salmson 95 h.p.	Puget and Lecarme	1 section	3
4. Farman 231	Renault 95 h.p.	Nouvel and Berlichon	1 "	4
5. Morane "Moth"	Gipsy 85 h.p.	Lebeau and Forestier	1 "	7
6. Morane "Moth"	Gipsy 85 h.p.	Hermann and Signerin	1 "	9
7. Caudron 193	Renault 95 h.p.	Palayret and Paquier	1 "	15
8. Morane "Moth"	Gipsy 85 h.p.	Rouques as far as Marseilles, then Bajac, Marseilles to Orly, with Mme. Bajac as passenger	1 "	18
9. Morane "Moth"	Gipsy 85 h.p.	Meccas and Charneaux	1 "	23
10. Guerciais T12	Renault 95 h.p.	Massot, Mmes. de Malakoff and de Beauvais	1 "	30
11. Potez 36	Renault 95 h.p.	de Rovin and Francisquet	1 "	33
12. Morane "Moth"	Gipsy 85 h.p.	de Montigny and Ridray	2 "	35
13. Farman 231	Renault 95 h.p.	de Clermont Tonnerre and Freton	2 "	48
14. Caudron "Luciole" 270	Salmson 95 h.p.	Brevier and d'Ahetze then Fanet	3 "	32
15. Morane "Moth"	Gipsy 85 h.p.	de Bimard and Geo. Ham	3 "	37
16. Morane "Moth"	Gipsy 85 h.p.	Jacques Andre and de Boigne	3 "	49
17. Potez 36	Renault 95 h.p.	Cendre and Laporte then Chauviere	3 "	60
18. Potez 36	Salmson 95 h.p.	Claude and Leon	4 "	49
19. Potez 36	Renault 95 h.p.	de Montecler	5 "	39
20. Potez 36	Salmson 95 h.p.	Dr. Crochet	5 "	93
21. Potez 36	Salmson 95 h.p.	Blairon and Martinoff, then Cendre	7 "	118

petitors had "checked in." The Nieuport limousine, carrying the Aero Club of France Committee, who had managed the Tour, was also among the first machines to arrive. This Committee, consisting of Commandant Louis Hirschauer, the Director of Tourist Aviation in the Air Ministry, Captain de l'Escaille, the Manager of the Veritas Co., and Madame Jaffaux-Tissot, the Secretary of the Contest Committee of the Aero Club of France, had followed the Tour throughout, and its great success was due in a large part to their skilful and tactful management. The pilots and their passengers also warmly praised the hospitality and generosity shown by the Dunlop Co. during the Tour.

The planes were ranged on their arrival in front of the Roland Garros Hangar of the Aero Club of France, and a reception, together with a champagne luncheon, then followed in that large shed. The Commandant Hirschauer presided, and, after thanking the Dunlop Co. for having created the Tour and congratulating the contestants on the fine showing that had been made, he introduced Col. Petavy, the Managing Director of the Dunlop Co.

The Colonel began by stating that he had often been asked the question why this Tour of France had been created. The reason, he declared, was simple.

An extensive development of tourist aviation in France, Col. Petavy asserted, was only waiting to be assured that there were properly equipped landing fields to accommodate the planes. The public also wanted to feel that air touring was safe and practicable.

Such questions, the Colonel added, could only be answered by practical demonstrations, and for this reason



FIRST, BUT NOT A WINNER: Brevier's Caudron "Luciole" 270 (95 h.p. Salmson) which was the first back at Orly, but penalties en route placed it 14th.

it. Such deductions being made up to a maximum of 30 points for each section. Each contestant was allowed 5½ hours to traverse a section of the Tour. If he exceeded this limit he was disqualified.

A climb to 2,500 metres was also required of each of the contestants during one of the sections of the Tour. The particular section was designated by one of the Commissaires in charge, and an additional 10 minutes was allowed in which to make the climb. A failure to do so resulted in a penalisation of 30 negative points. Other negative points were also incurred for the change, amongst other things, of a propeller (unless a spare was carried aboard the plane), a tail skid or a wheel. Also the opening of the motor housing or cylinders, which were sealed with cords before starting, etc.

The Official Classification of the Competitors, as issued by the Contest Committee of the Aero Club of France, is given in the accompanying table.

THE YARMOUTH MEETING.—The Great Yarmouth Corporation, in conjunction with the Norfolk and Norwich Aero Club, held a successful and well-attended meeting at Gorleston-on-Sea on Saturday and Sunday, September 5 and 6. Saturday morning was exceptionally bad from the weather point of view, and the doleful forecast made it look as if very few people would turn up. Actually, however, the forecast was far worse than the weather itself, and some 21 aircraft arrived for the meeting. The first item on the programme was an arrival competition, for which an extremely magnificent Cup was presented by the Corporation. This was won by Capt. Diamant, the aviation manager for the Dominion Motor Spirit Co., on his "Puss Moth." The programme on Saturday was somewhat de-arranged, as the majority of those who had intended to visit delayed their arrival in order to see what the weather was going to do. There were, however, several demonstrations of aerobatics and crazy flying, while the Rollason Aviation Co. from Croydon also did much joyriding. In the evening all the pilots, who were guests of the Corporation, together with some 100 other people, gathered at the Town Hall for a dinner, with a subsequent dance at the Winter Gardens, where they were the guests of the Mayor and his Corporation. On Sunday a large number of machines had turned up, and a very attractive programme of flying was carried through. There was an aerobatic competition in which the star turns were Flt. Lt. C. B. Wincott, on the "Arrow Active" (Hermes II), and F/O A. D. Selway on a "Comper Swift" (Pobjoy R), the winner being F/O Selway, who thus gained the first prize of a silver tankard. A balloon bursting competition was won by Sqd. Ldr. Woodhouse on Mr. H. Peake's "Bluebird" (Gipsy I). A message bag dropping competition was won by Flt. Lt. N. Cowper in the "Swift" (Pobjoy R), thus making two wins for the "Swift" out of four competitions. The taking off, landing and folding competition was won by F/O Leech in one of the R.A.E. Club's "Avians." F/O Leech judged his landing so exactly that he finished his run almost between the stakes which represented the door of an imaginary hangar, so that the time lost in pushing the machine into the "hangar" after folding the wings was nearly negligible. Among other interesting visitors was the "Windhover," which created a great deal of interest, as it was the first large amphibian machine the local people had seen. They (which would include seasonal visitors), incidentally, were evidently very interested in flying, for some 10,000 came to see the display, thereby making the show a thorough success and a fitting wind-up to the Yarmouth Publicity Week. Their enthusiasm was not confined to watching the aircraft only, for Mr. Rollason with his machines was kept going to the limit of his capacity on both the Saturday and Sunday. There is no doubt that a comfortable closed machine, such as the "Desoutter" which he uses, is nowadays much "Avro," wherein passengers are blown about and get the smell of castor oil.

BROOKLANDS NOTES.—Out of six new pupils who joined the Brooklands School of Flying last week three were ladies. Two were French pupils who originally learnt to fly at Brooklands, and are now taking a course of advanced instruction. A successful first solo was made during the week by Mr. Tillard.

On Thursday of last week a high official of the French Air Ministry paid a visit to the flying school. His avowed

The following prizes were awarded:—Thus, the Dunlop Cup for the first annual competition is awarded to de Rouvre, who will hold it until the second competition, and in addition the sum of 100,000 francs was divided as follows:—1st prize, 20,000 francs, to de Rouvre; 2nd prize, 12,000 francs, to Arnoux; 3rd prize, 8,000 francs, to Puget; 4th prize, 7,000 francs, to Nouvel; 5th prize, 6,000 francs, to Lebeau; 6th prize, 2,000 francs, to Hermann; 7th prize, 2,000 francs, to Palayret; 8th prize, 1,000 francs, to Bajac; 9th prize, 1,000 francs, to Meccas; 10th prize, 1,000 francs, to Massot; 11th prize, 1,000 francs, to de Rovin.

All the classified competitors, beginning with the sixth one on the list, also received prizes of 2,200 francs each. Numerous other prizes were also bestowed by the municipalities, Boards of Trade, aerodromes, etc., of the cities visited during the Tour.

R. C. W.

object was to inspect and study the methods of instruction followed by the school. He was given every facility, and after a close examination of every detail, expressed his congratulations on the whole organisation in terms which, even allowing for Latin politeness, were extremely flattering.

Having regard to the exceptionally bad weather this summer, it is interesting to note that the school has averaged 55 hr. per week. Had conditions been different this would undoubtedly have been greatly improved upon. Many Brooklands pupils have discovered that the weather is best in the early morning, with a result that quite a large proportion of flying time has been put in by early risers before breakfast.

The numerous private owners who visit Brooklands will be interested to know that excavations are in progress for a large circle in the centre of the aerodrome. At present the position is marked by a circle of red flags.

The Teignmouth Air Rally last Friday was attended by all Brooklands permanent private owners, and at least two members of the school will be taking machines to the South for the Cannes Air Rallye.

Considerable excitement was created recently when a soloist of extremely limited flying experience dropped in over the edge of the track in a most abandoned fashion and leapt out of the cockpit directly the machine came to rest. Amusement ripened to concern when he was seen to go to the locker and extract a package, out of whose wrappings emerged a perfectly good shot gun, which he proceeded to level at some invisible object.

It transpired that the "soloist" was actually Col. Strange, in a "Spartan" of similar colour, who had dropped in on his way back from partridge shooting in Norfolk, while the soloist was temporarily out of sight. As he landed one of the covey of Brooklands partridges who haunt the aerodrome had risen in front of him, and the temptation had been too much. Unfortunately, the partridges had seen the light of battle in his eye, and took themselves off hurriedly. They were last seen agitatedly landing down wind at Heston Airport.

THE TEIGNMOUTH meeting which was organised by Mr. Parkhouse, on Saturday, September 5, triumphed in the face of bad weather, and eventually developed into one of the most enjoyable meetings of the year. Mr. Parkhouse has a flair for making all his visitors at home and ensuring that both during the meeting and afterwards they enjoy themselves to the limit of their capacities.

In spite of the very thick weather, some 25 visiting aircraft arrived during the afternoon, thus forming a very respectable display for the crowd of about 5,000 persons who gathered to witness the race and other flying items on the programme. The high wind, however, made landing and handling the machines on the ground a matter of some difficulty, so much so that Capt. Lamplugh is said to have looked the other way each time a machine came in!

The race, which was a 25-mile circuit mostly within view of the aerodrome, was won by Mr. H. R. A. Edwards, flying his ancient Avro "Baby" (Cirrus I). Col. L. Strange, in a "Spartan" three-seater (Hermes II) was second and Mr. C. S. Napier, in his "Widgeon" (Gipsy I) was third.

Items of particular interest during the programme were aerobatic displays by Mr. "McGregor" on a "Moth," and Mr. C. Uwins on a "Bulldog." Mr. "McGregor"

covered the identity of a pilot who is well-known for the pleasure he takes in flying in the inverted position, and his wonderful display thoroughly justified his reputation. Mr. Uwins was, of course, most impressive on the "Bulldog," as the Jupiter engine makes a noise when diving such as never fails to impress people. In "bombing a submarine" Capt. H. Davis, on a "Moth" (Gipsy II), succeeded in getting a direct hit, though his "flour bag" was insufficient to sink the strange vehicle. Two "Southampton" flying-boats also came over from Plymouth and flew round the aerodrome.

In the evening there was a dinner at the Royal Hotel, and the occasion had special significance as it was the sixth anniversary of the day Mr. and Mrs. Parkhouse were married. In honour of this event they were presented with a bouquet by the visiting pilots and also had to go through the ordeal of a mock trial run on the lines of that for the Dunmow Flitch.

THE PROJECTED RALLY AT WEST WITTERING.—

The Guild of Air Pilots and Air Navigators announce that the projected Rally, arranged for Saturday, September 12, at West Wittering Aerodrome (by kind permission of Capt. The Rt. Hon. F. E. Guest), is postponed, owing to the inclusion of this aerodrome in the prohibited area.

THE PHILLIPS and Powis School of Flying now have

Com. C. W. Croxford on the staff of instructors. He served in the Royal Navy from 1914 to 1922, when he took up flying in the Royal Air Force; since then he has flown over a thousand hours, most on instruction, on different types of machines, both in this country and in the East. Our flying hours have been good this month considering the weather conditions; 292 hr. have been flown, and 26 new pupils have joined the school. Several pupils who have been living on the premises have completed their flying and tests in a matter of ten days or so, thus showing the advantage of living in a "flying atmosphere," and being able to take advantage of good weather conditions. Maj. Higman is one to be mentioned in this respect, as he completed his course and passed his tests in less than three days, although we should add that he had done a little spasmodic flying before. We should also like to congratulate our young pupil Mr. E. Humphreys, 17 years of age, who went solo after 6 hr. 10 min. dual.

THE BRISTOL GARDEN PARTY.—September 26 at

Bristol is not to be a "pageant" but an informal party for private owners, and all others who can manage to

visit the Club by air. The Bristol and Wessex Club, as hosts, will entertain all such visitors to tea at the airport, and a dinner and dance (full evening dress) at the Spa Hotel, Clifton, in the evening.

Will all who wish to come, please write to the Manager, Bristol and Wessex Aeroplane Club, Bristol Airport, Bristol, asking for an official invitation?

Col. and Mrs. Shelmerdine have kindly consented to be present.

The flying programme during the afternoon will be interesting. Mr. C. F. Uwins, by permission of the Bristol Aeroplane Co., Ltd., will give an exhibition on the "Bristol Bulldog."

It is hoped that a tri-motor Ford and the latest "Westland Wessex" will be there too. To amuse private owners it is intended to organise certain competitions and other attractions, details of which will be announced later.

It should be a very enjoyable afternoon, not too strenuous, and followed up by a good dinner and dance as the guests of the Club.

After the many strenuous flying meetings of the summer season, such an informal gathering will be appreciated where one will have plenty of time to meet one's friends, with a short programme followed by a pleasant evening.

It will be appreciated if all those intending to visit the garden party by air will inform the Club as soon as possible.

CINQUE PORTS FLYING CLUB.—The sun actually

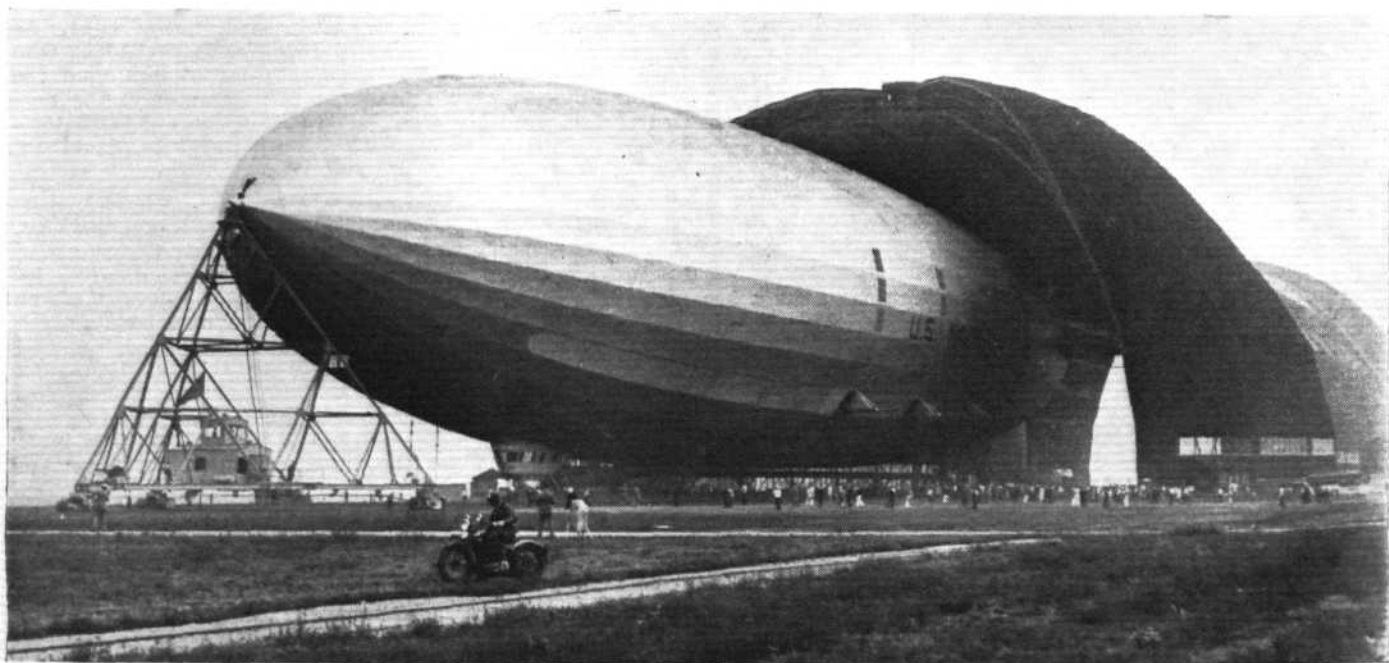
shone for some considerable time at Lympne during the week ending August 30, and consequently flying time was increased to 24 hr. This figure would have been higher had it not been that some of the fine days were spoilt by high wind.

On Monday Lt. Com. T. S. B. Gubbins and Mr. K. H. F. Waller returned from Le Zoute, where they had spent a very enjoyable week-end.

On Thursday one of the Club machines made a trip to Wimereux and back, but did not land on the other side.

On Saturday Mr. Cliff and Mr. Waller flew to the Antwerp Flying Meeting and returned to Lympne on Sunday evening. There was no competition on Sunday, but several cross-country flights were carried out by members. Maj. Parker flew his "Puss Moth" to Penshurst, where Mr. Hossle picked him up in G-EBTD, and brought him back to Lympne. Also, Mr. Kennett took G-AAKM to Croydon, where he met a friend and returned to Lympne later in the evening.

AMERICA'S NEW RIGID AIRSHIP



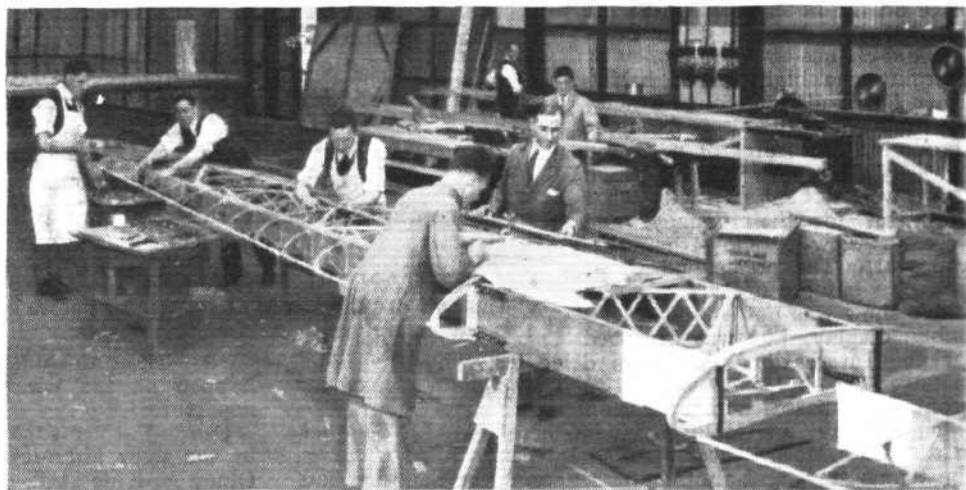
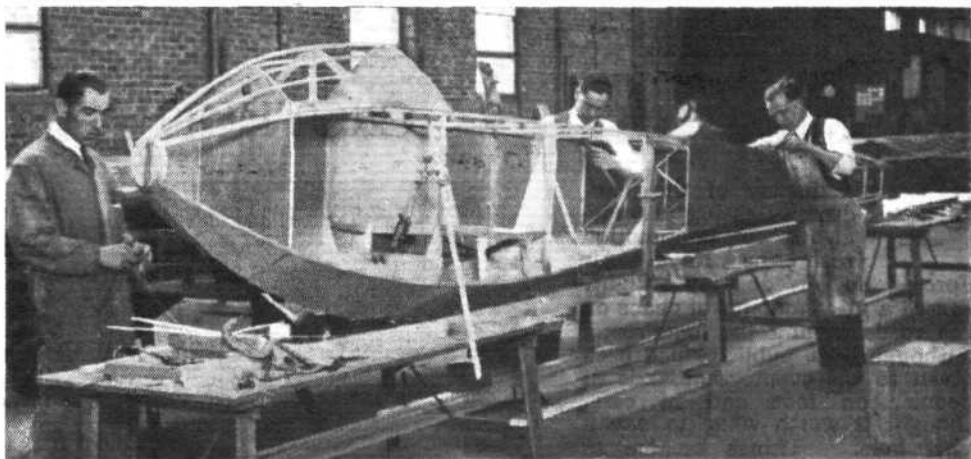
The U.S. Navy Dirigible "Akron" was taken from its hangar August 26 for the first time. A ground crew of 150 men lifted the 785-foot airship from its cradle and "walked" it part way out of the dock. The procedure was a practice drill in preparation for the "Akron's" trial flight, scheduled tentatively "after September 5." Our picture shows the "Akron" as she was brought out of her hangar attached to the movable mooring mast.

(See Note on Page 940)

THE "TERN" GLIDER

A NEW HIGH EFFICIENCY GLIDER.—Airspeed, Ltd., of Piccadilly, York, have recently constructed the "Tern," a glider which promises to uphold the prestige of English aircraft designers in this particular market. Mr. N. S. Norway and Mr. A. Hessel Tiltman are the joint Managing Directors, and Mr. Norway is primarily responsible for the design. As will be seen from the photographs, the glider is of the full cantilever type, with a high aspect ratio and a span of some 50 ft. It has already performed very creditably in the hands of various pilots, both English and German, all of whom have been loud in its praises. The photographs show various parts of the "Tern" under construction; that of the wing depicts very clearly the Warren girder drag bracing, so arranged as to provide exceptional torsional stiffness. This bracing consists of two flanges separated by the full depth of the main spar, which is considerable, since the wings are of cantilever construction joined by spruce lattice members. As a further help towards this stiffness and also as a safeguard when handling the machine, the whole of the leading edge is covered in three-ply wood. The ribs are simple and of the normal German construction, with glued three-ply gussets, and in fact German practice has been followed very largely in the wing, particularly in points like the trailing edge, the spring landing skid and many other details. In the cockpit arrangements and general make-up of the fuselage, British light aeroplane practice has been followed to a greater extent, thus this cockpit is roomy and particularly comfortable, and is fitted with a proper instrument board carrying an air speed indicator and cross level beneath a Cellon wind screen. The controls are on ball bearings, providing a light and positive control system.

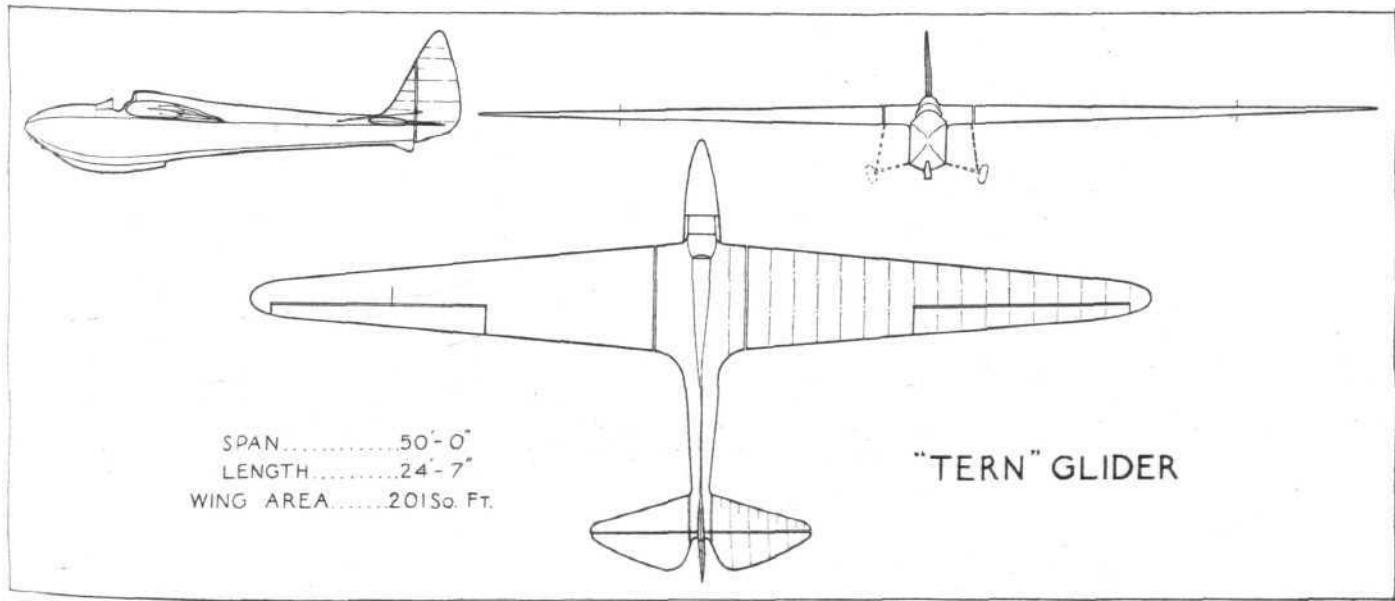
A particular feature of the machine is the ease with



The top photograph shows the fuselage of the Tern under construction and the lower view gives a clear idea of the wing assembly.

which it can be dismantled and assembled. Each wing is detachable from the centre section by taking out two large main bolts, while the aileron controls connect automatically and need no attention whatsoever when dismantling the wings. In a similar way, each tail plane has the elevator permanently attached to it, and thus needs no attention as the elevator control connects itself when

(Concluded at bottom of page 924.)





Airport News



CROYDON

THE display of the aerodrome lighting arrangements in conjunction with the Royal Air Force, on Wednesday night, caused a great amount of chaos on the roads around the aerodrome. Although little publicity had been given to the event, thousands of people, on foot and in cars, thought it worth while to pay a visit here. Things became so chaotic that extra police had to be sent for. An ugly scene took place on the hotel roof, where the management deemed it to be a splendid chance to make money by charging the high fee of half-a-crown for admission, to see exactly the same that others saw from the aerodrome enclosure for a penny. A rowdy element in the half-crown crowd were not satisfied with what they saw for their money, and were not slow to show their disapproval. The police had to be called to enforce order. As the whole show was not intended as a public display, but was arranged for the International Congress delegates, why the hotel management should consider it such a splendid chance for profiteering passes comprehension.

On Monday, Mr. Mollison landed here from Le Touquet in a "Puss Moth," accompanied by Senorita de Alvarez, the tennis star, and another passenger. The Senorita had apparently had a rough trip, as it was some time before she was able to proceed to town.

Later in the day, Mr. Steve Donoghue arrived from Ostend, and it is rumoured that he gave some lucky person here the winner for a future Derby. We've had some jockeys' tips before!

Tuesday saw a cut in the K.L.M. services, and they are now on their winter time-table. If one remembers rightly, they have started winter services earlier this year. The K.L.M. have had a successful summer season.

The Luft Hansa Company are to discontinue their night air mail to and from Berlin, as from October 16. No definite decision regarding the Belgian night air mail has yet been made, but it is rumoured around that they also will cease during October.

Herr Rathje, the night-flying Luft Hansa pilot on the Berlin-Peking route, is still in a Mongolian prison, where he is serving a sentence of five years for having flown over Mongolia. Strong efforts are being made by many Embassies for his early release. The W/T operator is in hospital minus a leg.

"Heracles," the fourth Handley-Page 42, has arrived. This is really a 42-seater, as it is the first of the European type, with seats for 38 passengers and a crew of four. "He" has not yet been on service. Imperial Airways continue to get teething troubles with these machines, and it is bound to take time to bring them up to stan-



DIGNITY AND IMPUDENCE: The Comper Swift (Pobjoy R) sheltering under the bow of Hadrian at Croydon just before Flt. Lt. N. Comper set out for Italy.

dard. The unfortunate part is, these little troubles always happen at the wrong time, generally on the point of departure.

Cirrus-Hermes engines continue to sweep all before them in the light aircraft races, reflecting great credit on Mr. Olney and his staff.

On Saturday last, the Teignmouth race, over a course of 50 miles, was won by the Avro "Baby G. Eaum," piloted by F/O H. R. A. Edwards, brother of the recent King's Cup winner. It will be remembered that the Avro "Baby" was the aircraft upon which Bert Hinkler flew from Croydon and achieved fame for his early non-stop flights to Rome and Riga. The Cirrus engine continues to do excellent work.

Friday and Saturday brought us weather of the worst type, and the aerodrome was nearly transformed into a lake; in fact, it must have been mistaken for one, as Mr. Ash, of Saunders Roe, dropped in on Saturday morning on the "Cutty Sark." He said he had a good mind to haul up his landing wheels and land on the water.

Sunday, however, made up for lost time, and the joy-riding people did extremely good business all day. Finishing joy rides at sunset is now a thing of the past, as the most enterprising firms here now have machines standing by with their lights on well after dark for clients who wish to take a night trip over the aerodrome.

Arrangements have now been made for the building of a radio beacon to further assist pilots of aircraft on the Continental air routes. It is expected that everything will be in working order early in the year.

The traffic figures for the week were:—Passengers, 2,005; freight, 92 tons.

P. B.

Heston Air Park Club

AIRWORK, LTD., have pleasure in announcing that as from September 4, 1931, they will grant free Customs clearance during official hours of attendance (weekdays 9 a.m. to 5 p.m.) to all private owners who are members of Heston Air Park, and who keep their machines at Heston Airport. At other times than the official hours,

Airwork, Ltd., will pass on to such members only the special charges that are incurred, viz., 1s. 6d. per outward clearance, and the hire of a car to bring the Customs officer to the Airport when necessary.

Night Flying.—It is hoped that night flying will take place on Saturdays and Sundays in October. Particulars will be circulated later.

THE "TERN"—concluded from page 923.
the tail plane is assembled. So simple is the whole operation that three men can completely rig and assemble the machine in less than 10 min. In a recent attempt Herr Magersuppe flew the "Tern" under record condi-

tions for a distance of 8½ miles from Ravenscar to Scarborough. After gaining a height of some 300 ft. he flew over the cliff edge in the rising current, but was unable to cross the town of Scarborough and had to land upon the beach, which he did quite safely.



A view of the Control Tower at Croydon lit by their own floodlight. The aircraft on the left are the two Vickers "Virginia" night-bombers. (FLIGHT Photo.)

NIGHT FLYING AT CROYDON

THERE was an exhibition of night flying and aerodrome lighting at Croydon on Wednesday night, September 2.

The event had not been announced as for the general public, but was chiefly held for delegates to the International Illumination Congress. Actually, however, quite a large crowd gathered and waited patiently throughout the programme without being told what it was about. It seemed a pity that no loud speaker had been slung outside the Tower so that someone could have broadcast a little information about what was going on.

The R.A.F. part of the programme did not start until 10.45 p.m., when one of the two Vickers "Virginia" night bombers which had previously taken off, landed by the light from Money flares laid out on the aerodrome. As soon as this aircraft had taken off again the second machine came down by the aid of a wing-tip flare; this was particularly imposing, as the light from the flare lit up the whole aerodrome and also a number of the houses round the edge, especially when she took off again—still with the same flare burning.

A Bristol fighter then came in, using an R.A.E. pattern landing lamp, which is, in effect, a large head lamp under the fuselage set so that its beam shines down on to the aerodrome. When the fighter had taken off again all three aircraft landed by the light of the 10-kw. floodlight, which is the standard light used for all the commercial aircraft at Croydon.

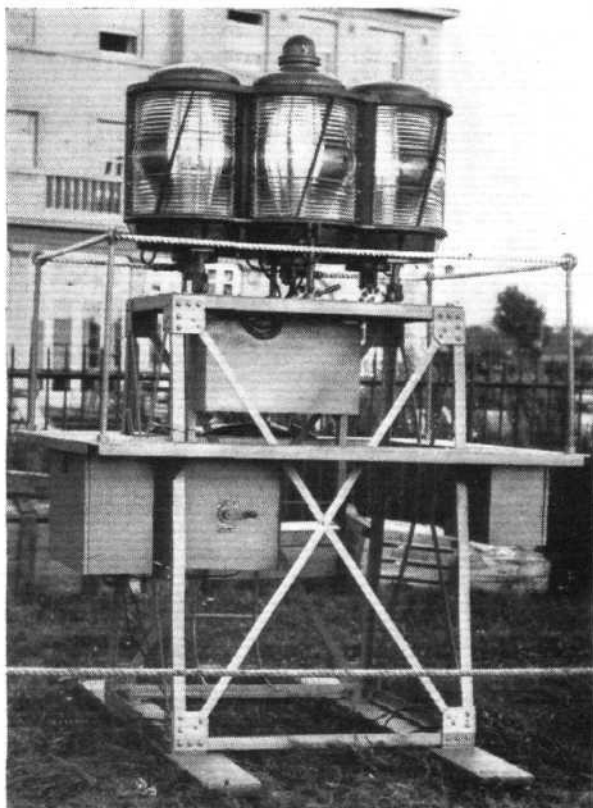
All three machines then taxied up to the front of the control tower, where they were

besieged by a large number of people. In the front of the hotel a display of new aerodrome lighting equipment had been staged, and after the flying had finished, these various instruments were each given a time to show their paces. The first to go on was a Floodlight Beacon, by Chance Bros. & Co., Ltd. This was a 5-kw., 4th order, 500-mm. diameter floodlight on a trailer. The dioptric lens was suitably housed in a weather-proof casing, following lighthouse practice, having a 5-kw. electric incandescent lamp projecting 180 deg. in the horizontal plane, but with only a narrow vertical divergence. When used as a flashing beacon the lens is tilted upwards, giving the centre of the beam an elevation of 30 to 35 deg. In this position the whole beacon is revolved about a vertical axis, giving the effect, at a distance, of short flashes separated by longer dark intervals.

The floodlight, complete with its own generating set, is mounted on a four-wheel pneumatically-tyred trailer. The beam is intensified by split and decentred mirrors, and gives a candle-power of some 550,000, with a 45-mile range as a beacon when the atmospheric transparency is 0.85. Quite a considerable number of these beacons have been supplied for use abroad, five having gone to the Middle East, one to Tanganyika, one to Southern Rhodesia and one to Ireland.

The second floodlight shown was a three-lamp one, also by Chance Bros. This also utilises 4th order, 500-mm. diameter dioptric lenses, and each lamp has a 1½-kw. lamp.

The three beams overlap, so that while 180 deg. illumi-



The Chance Bros. 3-lamp floodlight described above, (FLIGHT Photo.)

nation is provided, there would still be a good degree of illumination should one of the lamps fail. The mounting is upon two castors, and one pivot allowing the light to be slewed in any desired direction. Dimming is provided in order to obviate dazzle when taxiing, and the beams can be adjusted by a screw rise and fall on each lamp holder. As with the previous type of floodlight, twin decentred mirrors are used behind the lamps, with a consequent increase of illumination of some 70 per cent.

The General Electric Co. then switched on their 9-kw. landing floodlight, which was illustrated in FLIGHT last week. This floodlight employs nine 1,000-watt tubular horizontal type lamps, which are arranged horizontally in three rows of three, one above the other. Each lamp has its own parabolic silvered glass reflector, which is capable of adjustment to give the best focus. Each bank of three reflectors may also be tilted, or all three banks may be moved together, thus it is possible to adjust the floodlight to give the best distribution under any possible circumstances. A further refinement is the provision of separate switches for each lamp, so that the power, and consequently the lighting, may be varied from 1 kw. up to 9 kw. The horizontal illumination of this light covers 170 deg., and the isolux curve of equal illumination is nearly square in shape. The three banks of lamps, together with their reflectors, are mounted in a rigid framework, which in turn is fixed to a turntable. This turntable may be mounted on the back of a car, as was done at the night flying meeting held recently by Mr. Lindsay Everard at Ratchiffe, or simply rested on a base of suitable height, as was the case at Croydon. The beam candle-power of this lamp, as shown, was in the neighbourhood of 700,000 candles, and the modifications which are in hand will in all probability increase this very considerably. During the evening, the Service aircraft and others took off and landed by means of this floodlight, and visitors were able to see that the illumination provided made the work of the pilot particularly easy. No doubt this type of light has a great deal in its favour, as the number of individual lamps, though certainly increasing the complicity, does at the same time provide a safeguard against complete failure. A point, however, which we feel the makers would do well to pay some attention to is the weather proofing of the outside of the reflectors and the numerous hinges and levers which are necessary for the tilting arrangements. Such lights, particularly in foreign countries, must often of necessity be left in exposed positions for a very long time, and may be subject to extremes of hot and cold in both humid and dry atmospheres, and the prevention of corrosion is therefore of paramount importance. From this point of view the totally enclosed light which follows lighthouse practice has a great deal in its favour. Such weather proofing for the G.E.C. light should, however, present no very great difficulty, and, if fitted in a complete weather-proof case, it would undoubtedly provide most efficient lighting on any landing ground used for night flying.

The next demonstration was that of illuminated wind indicators. The first shown was a 10-ft. by 6-ft. indicator produced by Chance Bros. This utilised double-end tubular electric lamps as the illuminant, and consisted of a light steel channel framing in the shape of a Tee, with the lamps laid along the top of it. The framing was supported by a ballbearing pillar, and was perfectly free to move according to the direction of the wind, slip rings



The mobile "Chance" Floodlight Beacon which was demonstrated at Croydon on September 2. (FLIGHT Photo.)

on the shaft carrying the necessary current to the lamps. The current consumption was approximately 1 kw., and an added refinement was the fitting of an automatic wind velocity indicator. This was arranged to show an illuminated bar of light for low velocity, two bars for medium velocities, and three bars for high velocities. These successive illuminations were arranged to take place according to the desire of the user, and their colour was made distinctive to the main Tee lighting. A further refinement was a device which brought the whole Tee back to the best landing position in the event of the wind falling below a pre-determined figure.

The second wind direction indicator was that shown by the General Electric Co. This was a 20-ft. by 15-ft. Tee, and illuminated with a large number of 15-watt Osram lamps, which were under weather-proof glass covers, alternately coloured red and green. Slip rings on the bearing shaft provide the current for these lamps, and either the red or green lights may be switched on, thus indicating whether the pilot may land or not.

Chance Bros. also showed a 12-in. ceiling light. This was a 500-watt 100-volt projection lamp, with a single flat grid filament in front of a 12-in. parabolic glass reflector. It is used primarily for ascertaining the height of the clouds above the landing field. An aluminium clinometer with a graded scale is supplied, marked both in degrees and in feet-height, allowing equal readings to be made without calculation. Obstruction and boundary lights, the former an acetylene flashing type, giving a flash of 1/10th of a second every sec., were also shown by this firm.

The last exhibit was a "Moth" (Gipsy I) aeroplane, which was completely equipped with a Rotax lighting set, consisting of navigation lights, cockpit lights, an air-driven generator fitted to the undercarriage, and a particularly compact type of accumulator, the whole being eminently suitable for the private owner.





Air Transport



A SIAMESE AIR LINE

THE Aerial Transport Co. of Siam, Ltd., has recently imported four "Puss Moths" for use in the country. These are the first commercial machines to be registered in Siam. The occasion upon which the first two were publicly shown on the aerodrome of Don Muang was one of considerable importance. H.R.H. Prince Purachatra of Kambaeng Bejra, the Minister of Commerce and Communications, accompanied by Lt. General H.H. Prince Alongkot, the Acting Minister of War, Phya Prasdiddhi Salakar, Traffic Superintendent of the Royal State Railways, Phya Chao Vananusathiti, Chief Auditor of the Royal State Railways, Phya Prakrit Kolasatra, Director General of the Post and Telegraph Department, Mr. Otto Praeger, Adviser of the Post and Telegraph Department, Phya Birom, Bhakdi Nai Kim Phongse Thongthach, and Mr. E. D. Atkins, General Manager of the Anglo-Siam Corporation. All attended to witness the first flight of these machines. They were greeted by Major General Phya Chalerm Akas, Director General of the Aeronautical Department, Col. Phya Vehasyan Silpasiddhi, his Assistant, and other aviation officers. Mr. Praeger, who was the first to go up in one of the machines and was piloted by Lt. H.S.H. Prince Visish Svastiraks Svastivat. In the second machine, piloted by Maj. Sgt. Thui, was a *Daily Mail* camera-man. The A.T. Co. are to be congratulated on establishing this first commercial aircraft service in Siam, and we trust that their efforts will lead to the establishment of a service which will be of great value to Siam, for this is eminently a country where aerial transport should be of great economical value. The Royal Siamese Flying Corps is an exceptionally efficient force, and is composed of men who take the greatest interest in their work and are as keen as it is possible to be.

The first aeroplane to fly in regular service will be a combined passenger and mail plane, that will leave Korat at 7 o'clock in the morning, bound for Nakon Pnom, on the Indo-China border, over a flight of 620 km. The route will be via Roi Etch, Khonkaen and Udorn, and passengers taking breakfast in Korat will be able to have tiffin in Nakon Pnom.



The machine leaving Korat on the opening day of the service will carry mail for Nakon Pnom and Roi Etch, and such points as Mahasarakam which are served overland from Roi Etch. It will also carry mail from Roi Etch to Khonkaen, Udorn and Nakon Pnom. The return trip from Nakon Pnom is made over the same route, reaching Korat at 12.40 p.m. The itinerary of the Korat-Roi Etch-Nakon Pnom is as follows:—

Korat-Roi Etch: Distance, 200 km.; flying time, 1 hr. 20 min.

Roi Etch-Khonkaen: Distance, 95 km.; flying time, 38 min.

Udorn-Nakon Pnom: Distance, 220 km.; flying time, 1 hr. 26 min.

The passenger rates will be from 30 to 40 satangs per km. per person, according to distance, and the freight rates will be approximately 30 satangs per kg. per 100 km.

In addition to the through mail and passenger trip between Korat and Nakon Pnom, the Company will operate a purely mail and goods service every Thursday between Korat, Khonkaen and Udorn, a distance of 300 km. The outbound aircraft will leave Korat at 7 a.m., and the return trip will be made the same day.

The Company will operate specially chartered airplanes at the rate of one tical per km., which includes the return passage, plus 25 ticals per day for use of the plane. Thus, an aeroplane chartered from Udorn to Nakon Pnom, a distance of 220 km., would be 245 ticals for the round trip if the return were made in the same day, and 270 ticals if the return were made on the following day.

The service will be under the direction of Maj. Luang Saen Bholadeb, the Company's Chief Pilot and Assistant Operations Manager. Maj. Saen is perhaps the best-known active pilot in Siam. The other two pilots are Captains Luang Prijakart, and Koen Chamroenpluek, both long-time service men, who flew the Korat-Udorn and Ubol mail routes when those services were operated by the Army.

The Company has appointed Nai Buck Seng, of the Jawarad Co., Ltd., as its General Traffic Agent. In Korat the well-known old firm of Sin Huat Lu & Company will be the business agent of the Company.

The aircraft used are "Puss Moths" (Gipsy III), those for passenger work being absolutely standard, while those to be used solely for mails and freight have no back seat, the spare behind the pilot being entirely available for mails and goods.

H.R.H. Prince Purachatra, Minister of Commerce and Communications (left), standing with H.H. Prince Alongkot, Acting Minister of War, in front of the A.T. Co.'s Puss Moths on Don Muang aerodrome. The interest of such high officials should help to establish aerial transport in Siam very firmly.

Cheaper Air Travel for Air League Members

As the result of an agreement between the five airline companies calling at Croydon, and the Air League of the British Empire, members of the Air League will be entitled to a reduction on tariff rates for air fares when they travel on routes controlled by the companies concerned. The object of the agreement is to create a body

of air travellers who will also be seriously interested in the current problems of aviation, and who should, therefore, form an asset to civil aviation. As far as the League is concerned, the reduction is the first of a series of inducements to be offered to members to popularise the League with the man who is "buying" air transport or some other aviation service.

Airisms from the Four Winds

Miss Amy Johnson

MISS AMY JOHNSON has made a fairly rapid flight home from Japan in her "Puss Moth." As previously reported, she originally left Tokyo on August 24, but owing to bad weather had to return to Osaka. She resumed her journey on August 28, and by September 4 had reached Moscow, where only a short stop was made, after which she proceeded to Velikize-Luki, on the Latvian frontier. From here she was delayed by gales and storms on her journey to Königsberg, making two forced landings in Latvia. She landed eventually at Königsberg on September 6, but bad weather again held her up, and she did not reach Berlin until September 8. Miss Johnson left Berlin early on September 9 for England, and landed at Lympne in the evening.

A Round Australia Flight Record

FLYING a Sports Avro Avian ("Gipsy II"), Mr. H. F. Broadbent, of the New South Wales Aero Club, on September 6, established a new record for the "round-Australia" flight. He covered roughly 7,600 miles in 7 days 8 hr. 15 min., thereby beating the previous record held by Air-Commodore Kingsford-Smith. Incidentally, his is the first solo record for the circuit of Australia. His flying time for the trip was 83 hr. 35 min. Mr. Broadbent's machine was lubricated throughout with Wakefield Castrol oil.

Graf Zeppelin's Atlantic Flight

THE German airship, *Graf Zeppelin*, has added yet another noteworthy achievement to those already in her favour, for she has succeeded in making a round trip



MISS AMY JOHNSON IN JAPAN: A photograph taken on August 14, when General Nagaoka, President of the Aeronautical Society, Japan, entertained Miss Amy Johnson and her mechanic, Mr. Humphrey, to an informal Japanese tea party at his private house in Tokyo. Reading from left to right are: Madame Nagaoka, Miss Johnson, Mr. Ash (an American pilot), Mr. Humphrey and General Nagaoka.

from Friedrichshafen to Brazil and back in less than nine days, of which two were spent in Brazil. The *Graf Zeppelin* left Germany on August 29, and arrived at Pernambuco on September 1; leaving again on September 4, she arrived back at Friedrichshafen on September 7. When over the Bay of Biscay on September 6 the airship broadcast a concert of gramophone records, which was picked up and relayed to listeners by the Stuttgart and Toulouse wireless stations. This now makes eight Atlantic flights accomplished by the *Graf Zeppelin*—and it is proposed to make another trip to Brazil at the end of this month.

Von Grönau's Greenland Flight

THE German pilot, von Grönau, who is carrying out a survey flight in connection with an air service between Europe and America, has completed his task, and last week arrived at Chicago from Greenland.

Air Navigation Conference at Bucharest

A MEETING of the Air Ministers of Great Britain, France and Italy, with Prince Bibesco, President of the International Aeronautical Federation, will be held at Bucharest on October 10, to discuss rules for the control of air navigation.

New Under-Secretary of State for Air

THE KING has approved the appointment of Sir Philip Sassoon as Under-Secretary of State for Air in the new Government.

A High-Speed Long-Distance Flight

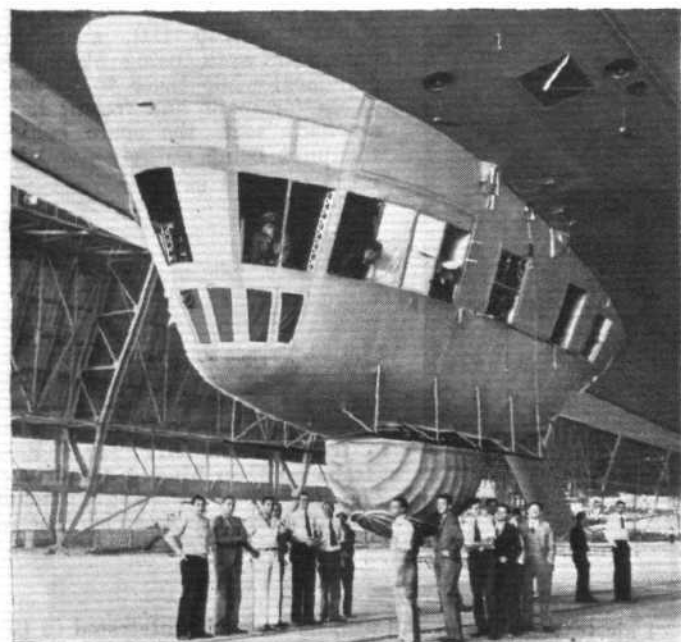
MAJ. "JIMMY" DOOLITTLE—who won the 1925 Schneider Trophy Contest—established a new trans-Continental record flight on September 4. He flew from Los Angeles to Newark, N.J., 2,550 miles, in 11 hr. 11 min. at an average speed of about 230 m.p.h.

The Do.S.

A NEW flying-boat, the Do.S., has been completed by the Dornier Aircraft Works at Friedrichshafen. She carries 25 passengers and has a cruising speed of 115 m.p.h.

Savoia Machines for Turkey

THE Turkish Government, it is reported, has decided to buy 18 Savoia-Marchetti seaplanes for the Turkish Air Force. They will be fitted with Italian engines, and are to be delivered before the end of the year.



THE U.S. AIRSHIP "AKRON": A closeup of the control cabin with part of the ground crew before the "Akron" slipped out of the hangar for the first time on August 26. Another photo of the Airship appears on page 922.

THE ROYAL AIR FORCE

London Gazette, September 1, 1931.

General Duties Branch

Pilot Officer on probation A. M. Carey (Special Reserve) is granted a short service commn. as Pilot Officer on probation with effect from and with seny. of August 17. The follg. are granted permanent commns. in ranks stated (September 1):—Flight Lieutenants.—C. P. Ashton-Jinks, P. R. Barwell, R. H. Donkin, V. G. A. Hatcher, D. V. Ivins, G. W. Tuttle. Flying Officers.—T. M. Abraham, A. Allen, P. F. C. Bradley, J. D. F. Bruce, B. D. Nicholas.

Lieut.-Cdr. J. H. I. Wood, R.N., is re-attached to R.A.F. as Flying Officer with effect from August 16, and with seniority of August 10, 1925. Pilot Officer on probation W. F. Pharazyn is confirmed in rank (July 28); Pilot Officer on probation E. M. Morris is confirmed in rank with effect from November 6, 1930, and is promoted to rank of Flying Officer with effect from May 6; Pilot Officer G. Nelson is promoted to rank of Flying Officer (April 25); Pilot Officer G. V. Barber takes rank and precedence as if his appointment as Pilot Officer bore date October 1, 1930. Reduction takes effect from August 18; Sqdn.-Ldr. L. G. S. Payne, M.C., A.F.C., is placed on half-pay list, Scale B (August 26).

The follg. Flying Officers are transferred to Reserve (September 1):—Class A.—L. Newcombe. Class C.—D. L. Maclean. The follg. Lts., R.N., Flying Officers, R.A.F., cease to be attached to R.A.F. on return to Naval duty:—C. W. Byas (July 14); C. A. Kingsley-Rowe (August 13).

Pilot Officer on probation A. R. Branford relinquishes his short service commn. on account of ill-health (September 2). The short service commns. of follg. Pilot Officers on probation are terminated on cessation of duty

(September 2):—E. D. Green, D. H. Oxley, H. L. Fendal. Lieut. G. G. R. Rodd, R.N., Flying Officer, R.A.F., relinquishes his temp. commn. on retirement from the Royal Navy (July 13).

Director of Music

Flight-Lieut. J. H. Amers, M.B.E., is placed on the retired list (September 1).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

R. W. Aitken is granted a commn. in Class AA (ii) as Pilot Officer on probation (August 10); W. S. Coates is granted a commn. in Class AA (i) as a Pilot Officer on probation (August 17).

Stores Branch

Flight-Lieut. F. S. Moore relinquishes his commn. on completion of service (May 12).

SPECIAL RESERVE

General Duties Branch

R. W. Harker is granted a commn. as Pilot Officer on probation (August 1); Pilot Officer on probation A. M. Carey relinquishes his commn. on appointment to a short service commn. in R.A.F. (August 17).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—Pilot Officer G. P. Kerr is promoted to rank of Flying Officer (May 2).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Flying Officers: J. H. Pool, to School of Tech. Training (Men), Manston, 11.8.31. C. Stephenson, to R.A.F. Depot, Uxbridge, 27.7.31. W. J. H. Lindley, to Central Flying School, Wittering, 8.8.31. N. W. Creasy, to No. 35 Sqdn., Bircham Newton, 19.8.31. J. A. S. Outhwaite, to Home Aircraft Depot, Henlow, 19.8.31. R. J. Carvell, to No. 3 Flying Training School, Grantham, 17.8.31.

Pilot Officers: H. L. Andrews, to No. 2 Flying Training School, Digby, 11.8.31. J. C. Larking, to R.A.F. Depot, Uxbridge, 10.6.31. A. M. Carey, to No. 10 Sqdn., Boscombe Down, on appointment to a Short Service Commn. as Pilot Officer on probation, 17.8.31. The following Pilot Officers are posted on appointment to Permanent Commns. from the Royal Air Force College, Cranwell, with effect from July 25, 1931:—C. W. Williams, to No. 32 Sqdn., Kenley; N. C. S. Rutter, to No. 12 Sqdn., Andover; A. McIlwaine, to No. 12 Sqdn., Andover; W. E. Oulton, to No. 3 Flying Training School, Grantham; S. C. Widdows, to No. 43 Sqdn., Tangmere; A. D. Messenger, to No. 3 Flying Training School, Grantham; A. C. Johnstone, to No. 23 Sqdn., Kenley; E. C. Ingham, to No. 32 Sqdn., Kenley; H. W. A. Chesterman, to No. 33 Sqdn., Biester; F. E. Stokes, to No. 23 Sqdn., Kenley; G. J. L. Read, to No. 101 Sqdn., Andover; A. C. Shearn, to No. 17 Sqdn., Upavon; L. F.

Brown, to No. 25 Sqdn., Hawkinge; W. P. Welch, to No. 3 Flying Training School, Grantham; N. H. Jackson, to No. 1 Sqdn., Tangmere; C. W. M. Ling, to No. 4 Sqdn., S. Farnborough; W. W. Stainthorpe, to No. 56 Sqdn., North Weald; D. Addenbrooke, to No. 29 Sqdn., North Weald; L. V. Andrews, to No. 2 Sqdn., Manston; D. I. P. MacNair, to No. 3 Flying Training School, Grantham; J. O. W. Oliver, to No. 43 Sqdn., Tangmere; N. A. R. Halliday, to No. 3 Flying Training School, Grantham; W. H. N. Turner, to No. 40 Sqdn., Upper Heyford; R. H. Page, to No. 40 Sqdn., Upper Heyford, and P. E. Drew, to No. 1 Sqdn., Tangmere.

The following Pilot Officers are posted to the R.A.F. Depot, Uxbridge, on appointment to Short Service Commns. with effect from 11.8.31:—D. C. T. Bennett, A. C. Drew, N. B. Littlejohn, J. R. Paget, and C. H. Smith.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—**Lieutenant (Flight-Lieutenant, R.A.F.).**—A. M. Ruddle, to *Victory* (September 13).

Sub-Lieutenant (Flying Officer, R.A.F.).—H. P. Bramwell, to *Courageous*, for full flying duties in 404 Flight.

Promotion

Sub-Lieut. P. L. H. D. Irven (Flying Officer, R.A.F.), to rank of Lieut. (seny August 16).

AIR MINISTRY NOTICES

NOTICES TO GROUND ENGINEERS

No. 48 of the year 1931. **Simmonds' Spartan and Spartan "Arrow" Aircraft. Modifications to Wing Root Rib for Aileron Controls. Notice to Ground Engineers, No. 37 of 1931—Amendment. (60361/30.)**

Cases of failure are reported of the root box ribs of the lower wings which support the aileron control gear, due to inadequate side stiffness against the aileron loads.

The following modifications, details of which are obtainable from Messrs. Spartan Aircraft, Ltd., E. Cowes, are therefore to be embodied:—

(a) Simmonds' Spartan Aircraft, with either Clarke YH or symmetrical wings:—

Wing root ply stiffening between the end rib and spar to be provided in accordance with drawing No. 739, Issue B.

Aileron lever assembly, drawing No. 392, Issue C, duralumin block (Pt. No. 113) superseded by the walnut packing block embodied in drawing No. 739, Issue B.

This modification affects symmetrical top and bottom planes in view of interchangeability.

(b) Spartan "Arrow" Aircraft:—

Wing root ply stiffening between the end rib and spar to be provided in accordance with drawing No. 1848, Issue A.

Aileron lever assembly, drawing No. 1489, Issue C, Duralumin block (Pt. No. 116) superseded by the walnut packing block embodied in drawing No. 1848, Issue A.

The above modifications must be incorporated in all aircraft that are affected within two months of the date of this Notice in order that the Certificate of Airworthiness of the aircraft shall remain valid.

(September 4, 1931.)

No. 49 of the year 1931. **D.H. 80A. "Puss Moth" Aircraft: Navigation Tail Lamps. (60361/31.)**

There appears to be a possibility of rudder flutter on aircraft of the above type when a heavy tail lamp is attached to the trailing edge of the rudder.

A modification incorporating a very light tail lamp in a low position on the rudder has accordingly been introduced, which now constitutes the only approved tail lamp installation for the "Puss Moth" with either large or small fin and rudder.

All existing tail lamps on these aircraft, together with their mounting blocks and wiring, must, therefore, be removed.

If it is desired to use navigation lights, the tail lamp must be installed in accordance with drawing No. M. 1664 copies of which may be obtained from the de Havilland Aircraft Co., Ltd., Stag Lane Aerodrome, Edgware, Middlesex.

The above instructions must be complied with immediately in the case of all "Puss Moth" aircraft fitted with navigation lights, in order that the Certificate of Airworthiness of the aircraft shall remain valid.

(September 5, 1931.)

Issue of "Initial Equipment" Aeroplanes to Units

As far as can be foreseen at present, the following are the approximate dates on which new types of aeroplanes will be supplied during the next few months:—

Type.	Unit.	In replacement of	Approximate Date.
Atlas T.M.	No. 5 F.T.S.	Bristol Fighter..	October, 1931.
	No. 2 F.T.S.	Bristol Fighter..	October, 1931.
	Station Flight, Duxford	Bristol Fighter..	November, 1931.
Bulldog	Halton	Bristol Fighter..	December, 1931.
	Station Flight, Upper Heyford	Bristol Fighter..	November, 1931.
	No. 19 Squadron..	Siskin ..	August-September, 1931.
IIF (F.A.A.)	Armament and Gunnery School	Gamecock ..	September, 1931.
	Central Flying School	Gamecock ..	September, 1931.
IIF (F.A.A.)	No. 444 Flight ..	IIF ..	August-September, 1931.
Fury ..	No. 25 Squadron..	Siskin ..	November-December, 1931.
Hart ..	India ..	Bristol Fighter..	To be shipped during September, October and November, 1931.
Nimrod ..	No. 402 Flight ..	Flycatcher ..	September, 1931 (postponed from June, 1931).
	Base Training Squadron, Leuchars	Do. (one I.E.)	October, 1931 (postponed from July, 1931).
	Base Training Squadron, Gosport	—	October, 1931 (postponed from July, 1931).
Wapiti, Mk. II (dual)	No. 501, Nos. 600 to 605 inclusive, Nos. 607 and 608 Squadrons	One I.E. each ..	August, 1931.
Wapiti, Mk. IIA	Armament and Gunnery School	Wapiti, Mk. II and Bristol Fighter	September - October, 1931.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

A SOARING HOLIDAY.

[2765] Those who spent those four glorious days amongst the heather and bilberry on Beamsley Beacon, and those who were fortunate enough to make flights, have expressed their approval and enjoyment in no unmeasured terms. It is, therefore, felt that there may be some who would care to take advantage of a similar opportunity to soar, should it be possible to make arrangements.

Unfortunately, Beamsley is not likely to be available again this season, at least until well into the winter, but there are other northern hills which are known to possess even better contours for soaring flight. During the four days preceding the conference the Aircraft Club kept people and horses available at short notice for launching and returning machines to the starting point; also there was printing and other expenses to be paid for. This was chiefly done for the benefit of our friends from the south, but, unfortunately, so few availed themselves of the opportunity that the show has resulted in a loss to the club which it cannot stand more than once a year. I think it quite possible that our committee would be willing to arrange another similar meeting later in the season, say September 16, 17, 18, and 19, but before doing so it would have to be assured that a reasonable number of good machines with capable pilots would turn up, and that those attending would put down a little hard cash beforehand.

I might add that the public has been so frequently brought out to see gliding displays and has had to go away disappointed that the support they give no longer pays for the printing of circulars, so that these meetings must be financed by the clubs themselves.

I feel that there must be a few in the country who would like to take part in such a meeting as outlined above, and I hope that they will write to me without delay, so that a concrete proposal can be placed before our committee.

RICHD. W. ADDYMAN,

Hon. Sec., Aircraft Club, Harrogate.

The White House, Starbeck, Harrogate.

July 15, 1931.

FREEDOM OF SPEECH

[2766] Will you allow me the publicity of your correspondence page in defence of freedom of speech?

In a review of the "Air Annual" in this week's FLIGHT, it is suggested, with reference to an article by Mr. Oswald Short, that "it would be an advantage if he would adopt the official definitions laid down in King's Regulations for the Royal Air Force."

I can see no advantage whatever in adopting official jargon in place of well-known words which came into existence long before the Air Ministry, and which still fulfil their purpose adequately. The older and more familiar names, such as aeroplane, seaplane and flying boat, convey their meaning unmistakably, whereas the word landplane, for instance, certainly does not do so.

At the present time we have far more supervision and interference on the part of Government officials than most people care for; and when this takes the form of dictating what words we are to use, it is time to protest. Perhaps your reviewer's long association with Service matters has endowed him with an unquestioning belief in the rightness of all official decrees, which is not held by those outside the Services.

As a writer, I have no quarrel with Major F. A. de V. Robertson, but as a protagonist of official interference with freedom of speech I disagree with him.

E. N. B. BENTLEY.

West Drayton, Middlesex.

September 5, 1931.

[Our reviewer's advocacy of Air Ministry definitions was not due to "an unquestioning belief in the rightness of all official decrees," but to the superior simplicity and clarity of those definitions over the war-time terms. We need a comprehensive term for all aircraft which are heavier than air. "Heavier than air craft" is clumsy, and compositors commonly make it into "heavier than aircraft." The word "aeroplane" rightly includes them

all. If "seaplane" is an acceptable term, then "landplane" must also be acceptable. War-time terms were much too sloppy and did not "fulfil their purpose adequately," e.g., "scout" for a fighter. How far would our correspondent go in claiming "freedom of speech"? Would he extend it to the use of Yankee, Cockney, and other variants of the English language?—ED.]

PUBLICATIONS RECEIVED

Technical Notes: No. 369, *Effect of Orifice Length-Diameter Ratio on the Coefficient of Discharge of Fuel-Injection Nozzles*. By A. G. Gellales and E. T. Marsh. March, 1931. No. 370, *Strength Tests on Paper Cylinders in Compression, Bending, and Shear*. By R. V. Rhode and E. E. Lundquist. April, 1931. No. 371, *Experiments with an Airfoil Model on which the Boundary Layer is Controlled without the Use of Supplementary Equipment*. By I. H. Abbott. April, 1931. No. 372, *Development of an Impinging-Jet Fuel-Injection Valve Nozzle*. By J. A. Spanogle and G. T. Hemminger. April, 1931. No. 373, *Investigation of the Discharge Rate of a Fuel-Injection System*. By H. C. Gerrish and F. Voss. April, 1931. No. 374, *Preliminary Study of Applied Load Factors in Bumpy Air*. By R. V. Rhode and E. E. Lundquist. April, 1931. No. 375, *Moments of Inertia of Several Airplanes*. By M. P. Miller and H. A. Soule. May, 1931. No. 376, *Effect of High Air Velocities on the Distribution and Penetration of a Fuel Spray*. By A. M. Rothrock. May, 1931. No. 377, *An Integrating Manometer for Use in Wind Tunnel Pressure Distribution Measurements*. By R. W. Noyes. May, 1931. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

NEW COMPANY REGISTERED

SURREY FLYING SERVICES, LIMITED.—Capital £6,000, in £1 shares. Acquiring the business of aircraft constructors, air taxi proprietors and pleasure flight contractors, carried on at Croydon Aerodrome, by F. W. J. Grant and A. F. Muir, as "Surrey Flying Services." First directors: F. W. J. Grant, 10, Purley Park Road, Purley, engineer; A. F. Muir, 56, Milton Road, Wallington, aircraft pilot; M. A. Cowan, Bridgefoot House, Ripley, aircraft pilot; C. W. J. Allen, "Cherry Trees," Link Lane, Wallington, aircraft pilot.

Secretary: M. A. Cowan. Solicitor: P. Holt, 19/21, George Street, Croydon.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1930

Published September 10, 1931

- 9,573. G. H. STAINFORTH. Protractor for use in navigation and air pilotage. (354,848.)
13,962. V. V. DIBOVSKY. Aircraft. (354,755.)
14,603. ECLIPSE AVIATION CORPN. Starters for i.c. engines. (354,732.)
15,187. P. CLERGET. Draining devices for cyls. of fixed radial-cyl. i.c. engines. (354,838.)
16,013. J. MCINTYRE. Rotary i.c. engines. (354,882.)
18,221. ECLIPSE AVIATION CORPN. Engine starters. (354,919.)
32,500. BLACKBURN AEROPLANE AND MOTOR CO., LTD., F. A. BUMPUS and R. THARRATT. Aircraft fuselages. (355,115.)
33,840. Y. H. KOUN. Aeroplanes. (355,128.)
34,571. H. JUNKERS. Reciprocating engines. (355,136.)

APPLIED FOR IN 1931

Published September 10, 1931

830. SOC. ANON. DES ATELIERS D'AVIATION L. BREGUET. Brake control for aeroplanes. (355,165.)

FLIGHT, The Aircraft Engineer and Airships.

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone (2 lines): Holborn, 3211.

Holborn, 1884.

Telegraphic address: Truditur, Westcent, London.

SUBSCRIPTION RATES POST FREE

UNITED KINGDOM		UNITED STATES		OTHER COUNTRIES*	
	s. d.				s. d.
3 Months	8 3	3 Months	\$2.20	3 Months	8 9
6 "	16 6	6 "	\$4.40	6 "	17 6
12 "	33 0	12 "	\$8.75	12 "	35 0

* Foreign subscriptions must be remitted in British currency.

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, and crossed "Westminster Bank."

Should any difficulty be experienced in procuring "FLIGHT" from local newsvendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.